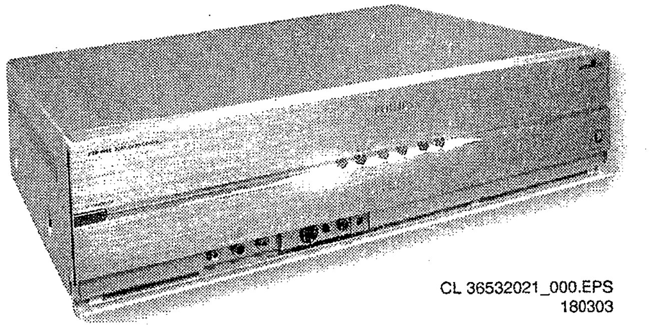
Colour Television

Chassis
F22RE
AA

Service
Service
Service



CL 36532021_000.EPS
180303

Service Manual

Contents

Page
1 Technical Specifications, Connection Facilities, and Chassis Overview 2
2 Safety Instructions, Maintenance, Warnings, and Notes 6
3 Directions for Use 7
4 Mechanical Instructions 22
5 Service Modes, Error Codes, Faultfinding, and Repair Tips. 25
6 *Block Diagrams*
Wiring Diagram 33
Block Diagram (Video) 34
Block Diagram (Audio + Supply) 35
Powerlines Overview 36
I^{2}C IC's Overview 37
Testpoint Overviews (AV + PS) 38
Testpoint Overviews (K + L + M) 39
7 *Electrical Diagrams and PWB lay-outs* *Diagram* *PWB*
AV Interface Panel (Diagram AV1) 40 48-50
HD Matrix + Sync Remover (Diagram AV2) 41 48-50
Sync Processing (Diagram AV3) 42 48-50
VGA / HD Selection (Diagram AV4) 43 48-50
Output Selection + Supply (Diagram AV5) 44 48-50
YPBPR RGB Matrix (Diagram AV6) 45 48-50
Video + RC Selection (Diagram AV7) 46 48-50
Audio + Control (Diagram AV8) 47 48-50
2D Comb Filter Add-on (Diagram CF) 51 51
Front Panel (Diagram FP1) 52 53
SSB: Tuner, IF, Sourse Select and Video Processing (Diagram K1) 54 61-66
SSB: Input/Output (Diagram K2) 55 61-66
SSB: Sound Processing (Diagram K3) 56 61-66
SSB: Audio Dolby (Diagram K4) 57 61-66
SSB: Video Control+ Geometry (Diagram K6) 58 61-66
SSB: TXT + Control (Diagram K7) 59 61-66

Contents

Page
SSB: Source Sel. (add to K1) (Diagram K8) 60 61-66
Feature Box 7: Feature Box (Diagram L1) 67 70-71
Feature Box 7: Eagle (Diagram L2) 68 70-71
Feature Box 7: Falconic (Diagram L3) 69 70-71
DW: Tuner + IF (Diagram M1) 72 77-78
DW: Selector Switches (Diagram M2) 73 77-78
DW: Filters + Buffers (Diagram M3) 74 77-78
DW: Dual Screen IC + Memory (Diagram M4) 75 77-78
DW: Audio (Diagram M5) 76 77-78
Power Supply (Diagram PS) 79 80-81
SD Connector Panel (Diagram SD) 82 83
8 Electrical Alignments 85
9 Circuit Descriptions 91
List of Abbreviations 107
IC-Data 109
10 Spare Parts List 115
11 Revision List 124

©Copyright 2003 Philips Consumer Electronics B.V. Eindhoven, The Netherlands. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.

Published by WO 0364 Service PaCE
Printed in the Netherlands
Subject to modification
EN 3122 785 13171

PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

1. Technical Specifications
   1. Reception
   2. Miscellaneous
2. Connections
   1. Front Connections
   2. Rear Connections
3. Chassis Overview

1.1 Technical Specifications

1.1.1 Reception

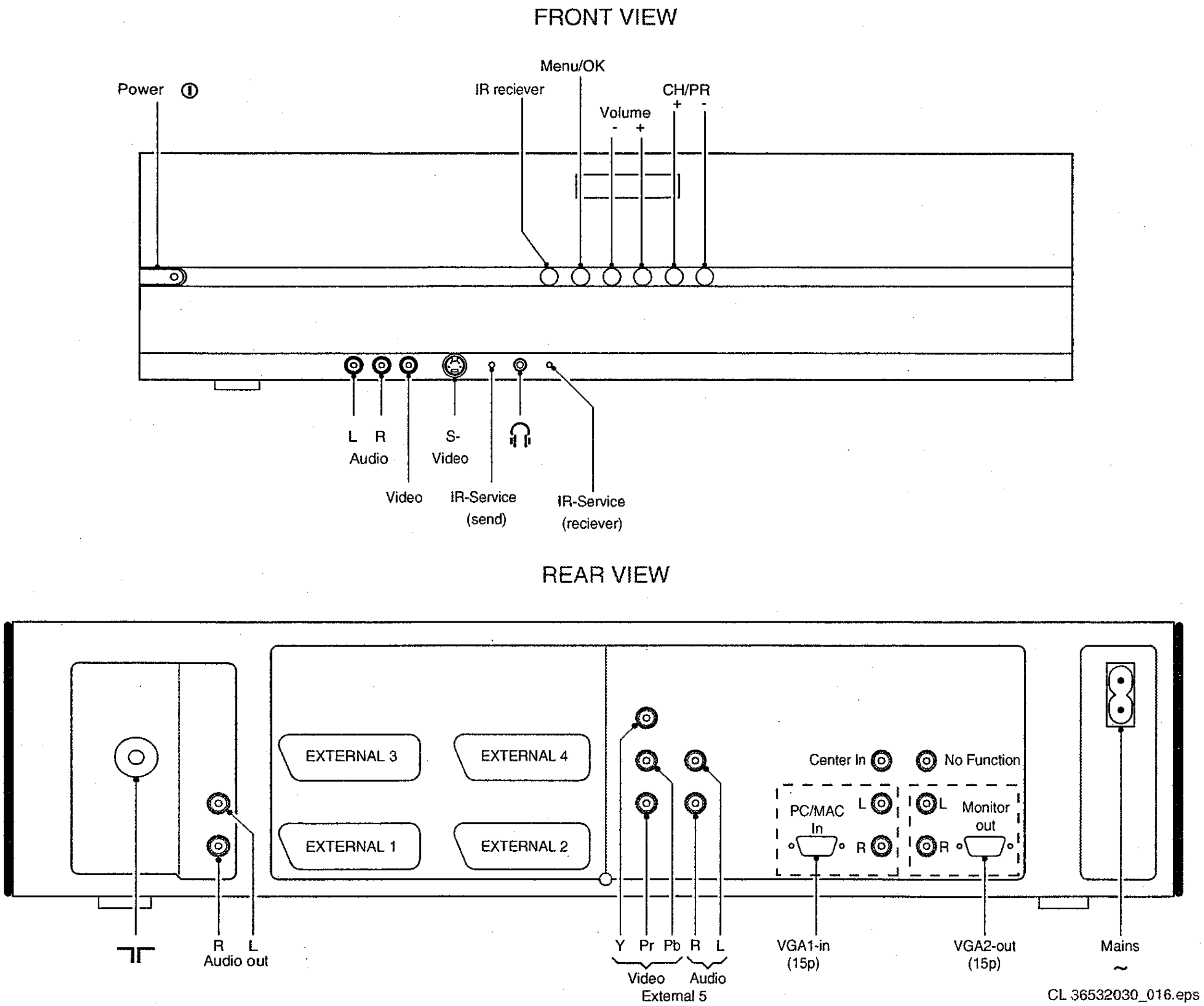
Tuning system	: PLL
Colour systems	: PAL B/G,D/K,I
	: SECAM B/G,D/K,L/L1
Sound systems	: FM/AM-mono
	: FM/FM B/G, Czech
	: NICAM B/G,D/K,I,L
A/V connections	: PAL B/G,D/K,I
	: SECAM B/G,D/K,L/L1
	: NTSC4.43 (playback only)
Channel selections	: 125 channels
	: Full cable, UVSH
Aerial input	: 75 ohm, IEC-type

1.1.2 Miscellaneous

Mains voltage	: 95 - 264 Vac
Mains frequency	: 50 - 60 Hz
Ambient temperature	: + 5 to + 45 deg. C
Maximum humidity	: 90% R.H.
Power ON dissipation	: 28 W typical
Power OFF dissipation	: 0.2 W typical
Standby Power dissipation	: 0.6 W Typical
Weight	: 4 kg
Dimensions (WxHxD)	: 435 x 100 x 330 mm

1.2 Connections

1.2.1 Front Connections


FRONT VIEW
Power ⏻
IR reciever
Menu/OK
Volume
- +
CH/PR
+ -
L R
Audio
Video
S-
Video
IR-Service
(send)
IR-Service
(reciever)
REAR VIEW
EXTERNAL 3
EXTERNAL 4
EXTERNAL 1
EXTERNAL 2
Center In
No Function
PC/MAC
In
L
R
L
R
Monitor
out
R L
Audio out
Y Pr Pb R L
Video
Audio
External 5
VGA1-in
(15p)
VGA2-out
(15p)
Mains
~

CL 36532030_016.eps
170403

Figure 1-1 Front and rear connections

Audio/Video - In

1	- Audio L	2.5 V_rms/33 kohm	→⊖◎
2	- Audio R	2.5 V_rms/33 kohm	→⊖◎
3	- Video CVBS	1 V_pp/75 ohm	→⊖◎
4	- Headphone	100 mW/8 ohm 15mW/2 kohm	◎ 🎧

SVHS - In

1	- Y	Ground	⏚
2	- C	Ground	⏚
3	- Y	1 V_pp/75 ohm	→⊖
4	- C	0.3 V_pp/75 ohm	→⊖

1.2.2 Rear Connections

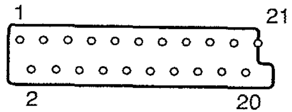
Aerial - In

1	- IEC-type	Coax, 75 ohm	⊤

Audio - Out (Constant Level)

1	- Audio L	0.5 V_rms/10 kohm	⊖→◎
2	- Audio R	0.5 V_rms/10 kohm	⊖→◎

EXT1: SCART - In/Out (RGB, CVBS)

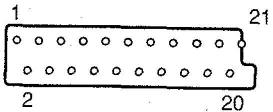


CL96532137_056.eps
171199

Figure 1-2 SCART connector

1	- Audio - R	0.5 V_rms/1 kohm	⊖→
2	- Audio - R	0.5 V_rms/10 kohm	→⊖
3	- Audio - L	0.5 V_rms/1 kohm	⊖→
4	- Audio	Ground	⏚
5	- Blue	Ground	⏚
6	- Audio - L	0.5 V_rms/10 kohm	→⊖
7	- Blue	0.7 V_pp/75 ohm	→⊖
8	- CVBS-status	0 - 1.3 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Green	Ground	⏚
10	-		
11	- Green	0.7 V_pp/75 ohm	→⊖
12	-		
13	- Red	Ground	⏚
14	- RGB-status	Ground	⏚
15	- Red	0.7 V_pp/75 ohm	→⊖
16	- RGB-stat./FBL	0 - 0.4 V: INT 1 - 3 V: EXT/75 ohm	
17	- CVBS	Ground	⏚
18	- FBL	Ground	⏚
19	- CVBS	1 V_pp/75 ohm	⊖→
20	- CVBS	1 V_pp/75 ohm	→⊖
21	- Shielding	Ground	⏚

EXT2: SCART - In/Out for VCR (RGB, CVBS, SVHS)

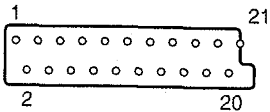


CL96532137_056.eps
171199

Figure 1-3 SCART connector

1	- Audio - R	0.5 V_rms/1 kohm	⊖→
2	- Audio - R	0.5 V_rms/10 kohm	→⊖
3	- Audio - L	0.5 V_rms/1 kohm	⊖→
4	- Audio	Ground	⏚
5	- Blue	Ground	⏚
6	- Audio - L	0.5 V_rms/10 kohm	→⊖
7	- Blue/C	0.7 V_pp/75 ohm	→⊖
8	- CVBS-status	0 - 1.3 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Green	Ground	⏚
10	- Easy Link	P50	→⊖
11	- Green	0.7 V_pp/75 ohm	→⊖
12	-		
13	- Red	Ground	⏚
14	- RGB-status	Ground	⏚
15	- Red/C	0.7 V_pp/75 ohm	→⊖
16	- RGB-stat./FBL	0 - 0.4 V: INT 1 - 3 V: EXT/75 ohm	
17	- CVBS	Ground	⏚
18	- FBL	Ground	⏚
19	- Y/CVBS	1 V_pp/75 ohm	⊖→
20	- Y/CVBS	1 V_pp/75 ohm	→⊖
21	- Shielding	Ground	⏚

EXT3: SCART - In (CVBS, Audio)

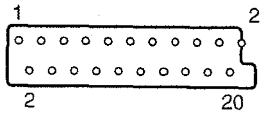


CL96532137_056.eps
171199

Figure 1-4 SCART connector

1	-		
2	- Audio - R	0.5 V_rms/10 kohm	→⊖
3	-		
4	- Audio	Ground	⏚
5	-	Ground	⏚
6	- Audio - L	0.5 V_rms/10 kohm	→⊖
7	-		
8	- CVBS-status	0 - 1.3 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	-	Ground	⏚
10	-		
11	-		
12	-		
13	-	Ground	⏚
14	- Status	Ground	⏚
15	-		
16	-		
17	- CVBS	Ground	⏚
18	- CVBS	Ground	⏚
19	-		
20	- CVBS	1 V_pp/75 ohm	→⊖
21	- Shielding	Ground	⏚

EXT4: SCART- In (CVBS, Audio)



CL96532137_056.eps
171199

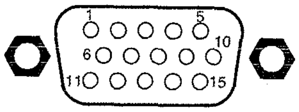
Figure 1-5 SCART connector

1 -			
2 - Audio - R	0.5 V_rms/10 kohm	→○
3 -		
4 - Audio	Ground	⏚
5 -	Ground	⏚
6 - Audio - L	0.5 V_rms/10 kohm	→○
7 -		
8 - CVBS-status	0 - 1.3 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9 -	Ground	⏚
10 -		
11 -		
12 -		
13 -	Ground	⏚
14 - Status	Ground	⏚
15 -		
16 -		
17 - CVBS	Ground	⏚
18 - CVBS	Ground	⏚
19 -		
20 - CVBS	1 V_pp/75 ohm	→○
21 - Shielding	Ground	⏚

EXT5: SD - In (YPbPr, Audio)

- - Y	1 V_pp/75 ohm	→○◎
- - Pr	0.7 V_pp/75 ohm	→○◎
- - Pb	0.7 V_pp/75 ohm	→○◎
- - Audio - L	0.5 V_rms/1 kohm	→○◎
- - Audio - R	0.5 V_rms/1 kohm	→○◎

PC/MAC - In (Sub-D: RGB+H/V)



CL 16532023_043.eps
210901

Figure 1-6 VGA connector

1 - Red	0.7 V_pp/75 ohm	→○
2 - Green	0.7 V_pp/75 ohm	→○
3 - Blue	0.7 V_pp/75 ohm	→○
4 - Data 2	n.c.	
5 - Test	Ground	⏚
6 - Red	Ground	⏚
7 - Green	Ground	⏚
8 - Blue	Ground	⏚
9 - n.c.		
10 -	Ground	⏚
11 - Data 0	n.c.	
12 - Data 1	n.c.	
13 - H-sync	0 - 5 V/1 kohm	→○
14 - V-sync	0 - 5 V/1 kohm	→○
15 - Data 3	n.c.	

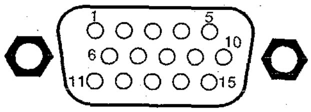
Audio PC/MAC - In (Cinch: VGA1, Centre)

1 - Centre	0.5 V_rms/10 kohm	→○◎
2 - Audio L	0.5 V_rms/10 kohm	→○◎
3 - Audio R	0.5 V_rms/10 kohm	→○◎

Audio Monitor - Out (Cinch: VGA2, RC-in)

1 - RC - in	5 V	→○◎
2 - Audio L	0.5 V_rms/10 kohm	○→◎
3 - Audio R	0.5 V_rms/10 kohm	○→◎

Monitor - Out (Sub-D: RGB+H/V, UART)

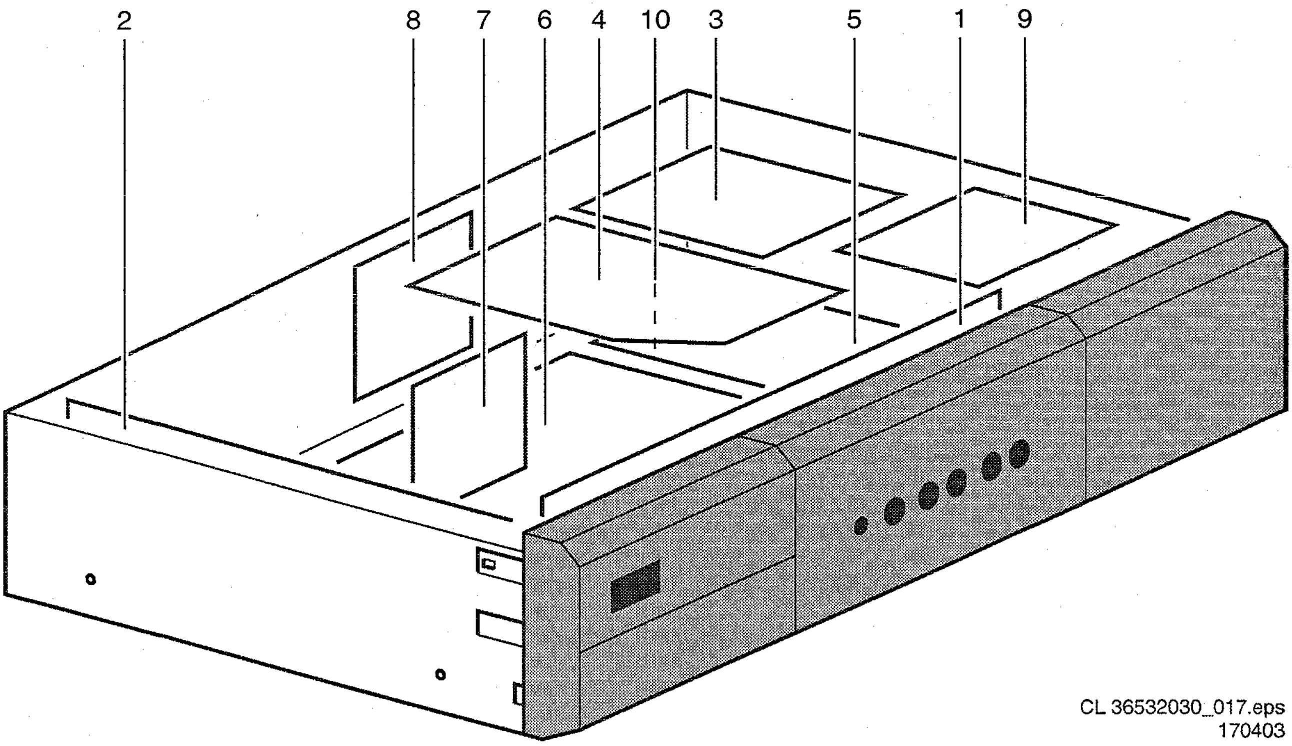


CL 16532023_043.eps
210901

Figure 1-7 VGA connector

1 - Red	0.7 V_pp/75 ohm	○→
2 - Green	0.7 V_pp/75 ohm	○→
3 - Blue	0.7 V_pp/75 ohm	○→
4 - Data 2	n.c.	
5 - Test	Ground	⏚
6 - Red	Ground	⏚
7 - Green	Ground	⏚
8 - Blue	Ground	⏚
9 - RC		→○
10 -	Ground	⏚
11 - Data 0	CONFIG_IDENT	○→
12 - Data 1	UART - TXD	○→
13 - H-sync		○→
14 - V-sync		○→
15 - Data 3	UART - RXD	○→

1.3 Chassis Overview



CL 36532030_017.eps
170403

Figure 1-8 Panel position

1. Front I/O Panel (FP).
2. Power Supply Panel (PS).
3. Double Window Panel (DW).
4. Feature Box (FBX).
5. Small Signal Panel (SSP).
6. Audio Video Interface Panel (AVI).
7. Scaler Panel (if present).
8. Standard Definition Connector Panel (SD).
9. 3D Comb Panel (C) (US only)
10. 2D Comb Filter Add-on (CF)

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:

- Connect the Receiver box to the Mains via an isolation transformer.
- When you use the Receiver box in combination with a plasma monitor, do not operate the monitor without the front glass plate. One function of this glass plate is to absorb IR radiation. Without this glass plate, the level of radiation could damage your eyes.
- Safety components, indicated by the symbol ⚠, must be replaced with original components.

Safety regulations require that **after** a repair, you must return the set in its original condition. Pay particular attention to the following points:

- Route the wire trees in their original positions and fix them in place with the mounted cable clamps.
- Check the insulation of the Mains cord for external damage.
- Check the electrical DC resistance between the Mains plug and the secondary side (only for sets which have a Mains isolated power supply):
  - Unplug the Mains cord and connect a wire between the two pins of the Mains plug;
  - Set the Mains switch to the "on" position (keep the Mains cord unplugged!).
  - Measure the resistance value between the pins of the Mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  - Set the Mains switch to the "off" position, and remove the wire between the two pins of the Mains plug.
- Check the cabinet for defects, to prevent the customer from touching any inner parts of the television set.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD symbol ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same electrical potential as the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:
  - Complete ESD3 kit (small tablemat, wristband, connection box, extension cable and earth cable): 4822 310 10671.
  - Wristband tester: 4822 344 13999.
- Be careful while taking measurements in the live voltage section.
- Never replace modules, or other components, with the television set "ON."
- Use plastic tools, instead of metal tools, when performing alignments on the television set. This will help prevent short circuits and reduce the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the direct voltages and oscillograms with regard to the chassis ground (symbol ⏚), or hot ground (symbol ⏚).
- The direct voltages and oscillograms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 61.25 MHz (NTSC).
- Where necessary, measure the oscillograms and direct voltages with (symbol ⫪) and without (symbol ⫪̸) aerial signal. Measure the voltages in the power supply section both in normal operation (symbol ①) and in standby (symbol ⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

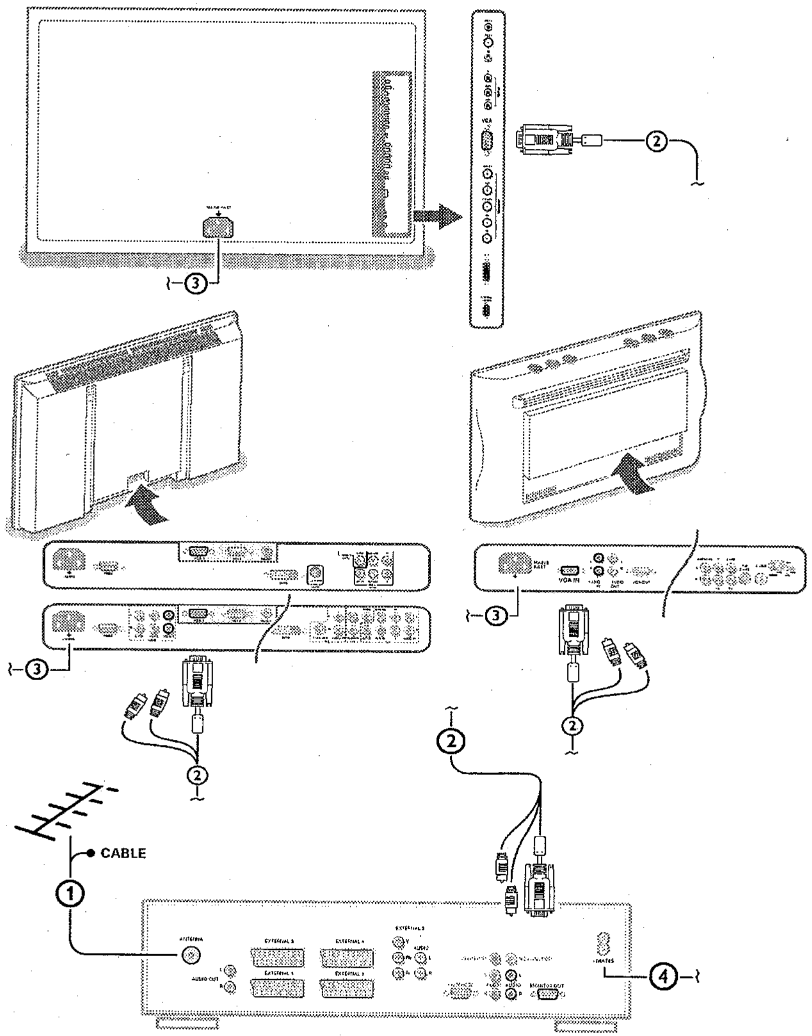
2.3.2 Schematic Notes

- All resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an 'E' or an 'R' (e.g. 220E or 220R indicates 220 ohm).
- All Capacitor values are expressed in Micro-Farads ($\mu = x10^{-6}$), Nano-Farads ($n = x10^{-9}$), or Pico-Farads ($p = x10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An 'asterisk' (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

2.3.3 Practical Service Precautions

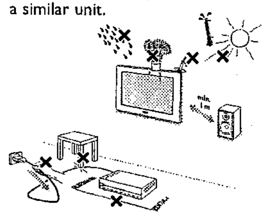
- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions - reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.
- **Before powering up the TV set with the rear cover off** (or on a test fixture), attach a clip lead to the CRT DAG ground and to a screwdriver blade that has a well insulated handle. After the TV is powered on and high voltage has developed, probe the anode lead with the blade, starting at the case of the High Voltage Transformer (flyback - IFT). Move the blade to within two inches of the connector of the CRT. **If there is an arc, you found it the easy way, without getting a shock!** If there is an arc to the screwdriver blade, replace the part that is causing the problem: the High Voltage Transformer or the lead (if it is removable).

3. Directions for Use



Preparation

❶ Place the receiver box wherever you want, but make sure that air can circulate freely through the ventilation slots. Do not install the receiver box in a confined space such as a book case or a similar unit.



To prevent any unsafe situations, no naked flame sources, such as lighted candles, should be placed on or in the vicinity. Avoid heat, direct sunlight and exposure to rain or water. The equipment shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on it.

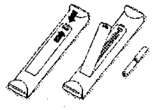
❷ Connect the supplied aerial cable ① and the VGA cable with trailing audio cinch connectors ② as shown in the inside frontcover of this handbook. Make sure all screws of the cable ② are tightened well.

TV receiver box with speakerless monitor:
In case you connect your TV receiver box with a speakerless monitor, and without having connected an audio receiver, all references made in this instruction book to sound reproduction, volume control, and audio connections, are not applicable (except for a headphone connection).
The keys on the remote control referring to sound have no function either.

❸ To connect your computer, see the separate supplied instruction manual with your monitor.
To connect other peripherals, see p. 19.
If you dispose of a Cinema Link combination (Cinema Link Audio receiver and/or Cinema Link video recorder and/or DVD player), see the separate supplied instruction manual.
In order to obtain the best result, please use only the supplied antenna cables between the receiver box and videorecorder, and between videorecorder and antenna connector.

❹ Insert the mains cord supplied ③ into the mains at the back of the monitor and the mains cord ④ at the back of the receiver. Put both in the wall sockets.

❺ **Remote control**: Insert the 2 batteries supplied (Type R6-1,5V).



The batteries supplied do not contain the heavy metals mercury and cadmium. Please check on how to dispose of exhausted batteries according to local regulations.

❻ **Switch the TV on** : Press the power switch ⏻ at the right side of the monitor and the one on the front of your receiver box. An indicator on the front of the TV lights up and the screen comes on. If the TV is in standby mode, press the **-P+** keys or the red ⏻ key on the remote control.

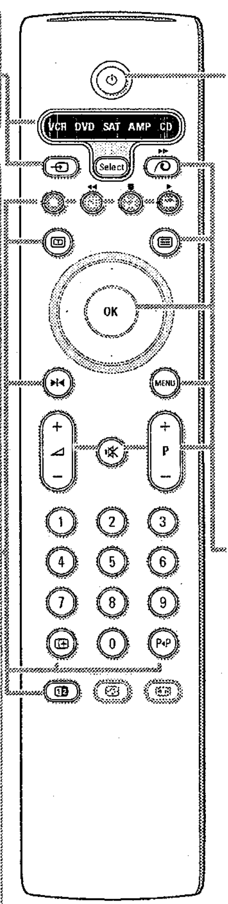
Use of the remote control RC4301

*Note: For most keys pressing a key once will activate the function. Pressing a second time will de-activate it. When a key enables multiple options, a small list will be shown. Press repeatedly to select the next item in the list. The list will be removed automatically after 4 seconds or press **OK** to remove immediately.*

Remark: in VGA mode only some keys are valid. See VGA menu, p. 21.

VCR DVD SAT AMP CD
See 'Audio- and Video equipment keys', p. 22.

Select your computer or other peripherals
See p. 21.



● ◀◀ ■ ▶ ▶▶
Audio and Video equipment keys, see p. 22.

● Instant record
See Record with your recorder with EasyLink, p. 22.

Time display
The time is displayed on the screen.

Surround mode
Press this key repeatedly to select on/off.

Cinema Go
See separate Cinema Link booklet supplied.

NEXTVIEW On/Off see p. 15
Press to show NEXTVIEW/ Teletext Guide on the right half of the screen.

Freeze/Replay/Photo finish
See p. 8.

On Screen information
Press to display information about the selected TV channel and programme.

P<P Smart surf / NEXTVIEW themes
With this key you can easily switch between 2 up to 9 different TV channels or sources or quickly select TV programmes if NEXTVIEW with defined themes is broadcast. See General, Smart surf, p. 8.
Press the **OK** key or wait for the time out to dismiss the Smart surf display.

⏻ Standby
Press to switch the TV on or off. When switched off, a red indicator on the TV lights up. When acquiring NEXTVIEW, see p. 16, an orange indicator lights up and after a period of max. 1 hour the TV is switched to full standby and the red indicator lights up.

Pixel Plus demo on/off
In the right part Pixel Plus and Digital Natural Motion are switched on.

Teletext On/Off see p. 17
Press the key to show teletext on the right half of the screen.

OK Press this key
- to activate your choice, when in the menus.
- to display the programme list.

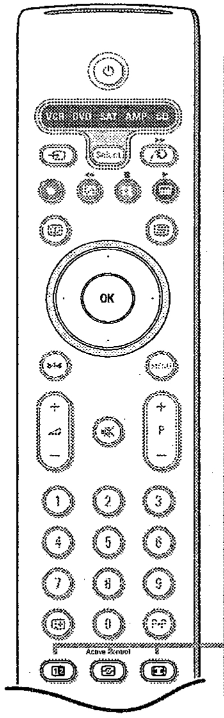
MENU Main menu on/off see p. 5

◿ To adjust the volume.

Interrupt the sound or restore it.

P Programme selection
To browse through the TV channels and sources stored in the favourite list.

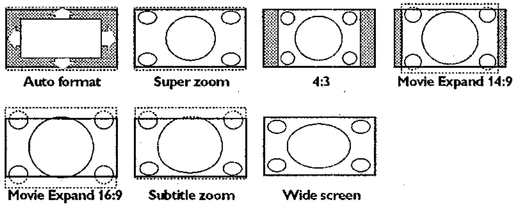
0/9 Digit keys
To select a TV channel.
For a two digit programme number, enter the second digit before the dash disappears. To switch immediately to a selected one digit TV channel, keep the digit key pressed a bit longer.



Dual screen / PIP / Multipip
See p. 8 and p. 14.

Active control see p. 11.

Picture format
Press this key repeatedly or press the cursor up/down to select another picture format: Auto format, Super zoom, 4:3, Movie Expand 14:9, Movie Expand 16:9, Subtitle zoom or Wide screen.



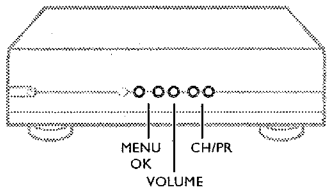
Auto format makes the picture fill the screen as much as possible.
In case of subtitles in the bottom black bar, Auto format makes the subtitles visible.
In case of a broadcaster logo in the corner of the top black bar, the logo disappears from the screen.

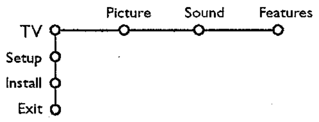
Super zoom removes the black bars on the sides of 4:3 programs with minimal distortion.

When in Movie Expand 14:9, 16:9, Super zoom or Subtitle zoom picture format, you can make subtitles visible with the cursor up/down.

Note: in VGA mode press the key to switch between a 4:3 or a Wide screen picture format.

Keys in front of the TV receiver box





Should your remote be lost or broken you can still change some of the basic settings with the keys in front of the TV receiver box.

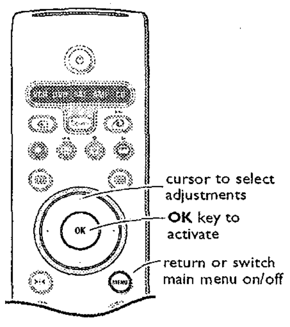
Press:
- the **VOLUME**- or + key to adjust the volume;
- the **-CH/PR+** keys to select the TV channels or sources.

The **MENU** key can be used to summon the main menu without the remote control.

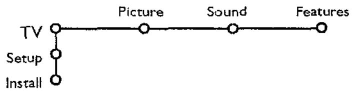
Use:
- the ◿ - and + keys and the **CH/PR-** and **CH/PR+** keys to select menu items in the directions as shown;
- the **MENU** key to confirm your selection.

Note:
*When activated via the **MENU** key in front of the TV receiver box, only **Exit** lets you dismiss the menu. Navigate to **Exit** and press the **MENU** key.*

To use the menus


cursor to select adjustments
OK key to activate
return or switch main menu on/off
OK

➊ Press the **MENU** key on the remote control to summon the main menu. At any moment you can exit the menu by pressing the **MENU** key again.
Note: If you have connected equipment with Cinema Link, more menu items are present.


TV
Setup
Install
Picture
Sound
Features

➋ Use the cursor in the up/down direction to select the **TV**, **Setup** or **Install** menu.
Use the cursor left/right to select **Picture**, **Sound** or **Features**.
Note: Sometimes not all the menu items are visible on the screen (indicated by a cluster of blue balls). Use the cursor down or right to reveal all items.

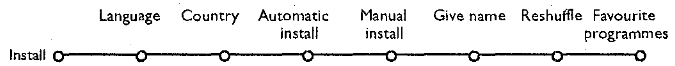
➌ Use the cursor in the left/right direction to select the menu item.

➍ Use the cursor up/down again to select the control you want to select or to adjust.

Note: Items temporary not available or not relevant are displayed in a light grey colour and cannot be selected.

Installation

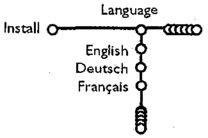
The installation menu contains the following items:

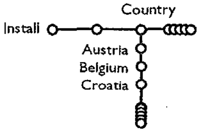

Install
Language
Country
Automatic install
Manual install
Give name
Reshuffle
Favourite programmes

EasyLink

If your video recorder has an EasyLink function, during installation, the language, country and available channels are automatically transmitted to the video recorder.

Select the menu language and country


Install
Language
English
Deutsch
Français


Install
Country
Austria
Belgium
Croatia

➊ Press the **MENU** key on the remote control.

➋ Use the cursor down to select **Install**.

➌ Use the cursor right to select **Language**.
Follow the instructions on screen.

➍ Use the cursor up/down to select your preferred language and press the **OK** key to confirm your selection.

➎ Use the cursor right to select **Country**.

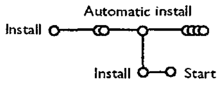
➏ Select the country where you are now located and press the **OK** key.
Select **Other** when none of the countries applies.

➐ Proceed with the **Install** menu.

Store TV channels

After language and country are set correctly, you can now search for and store the TV channels in two different ways: using Automatic Installation or Manual Installation (tuning-in channel by channel).
Select your choice with the cursor right.

Automatic installation


Install
Automatic install
Install
Start

➊ Select **Automatic Install** in the Install menu.
Note: All channels must be unlocked in order to autoprogram. If requested, enter your code to unlock all channels. (See TV, Features menu, Childlock, p. 13.)

➋ Press the cursor down.
The autoprogramming option label **Start** appears.

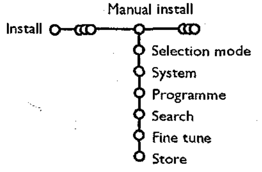
➌ Press the cursor right.

➍ The message **Searching** appears and the progress of autoprogramming is displayed.

If a cable system or a TV channel which broadcasts ACI (Automatic Channel Installation) is detected, a programme list appears. Without ACI broadcast, the channels are numbered according your language and country selection. You can use Reshuffle to renumber them. See p. 7.

It is possible that the cable company or the TV channel displays a broadcast selection menu. Layout and items are defined by the cable company or the TV channel. Make your choice with the cursor and press the ***OK*** *key.*

Manual installation


Install
Manual install
Selection mode
System
Programme
Search
Fine tune
Store

Searching for and storing TV channels is done channel by channel. You must go through every step of the Manual Installation menu.

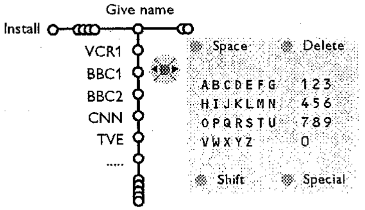
➊ Select **Manual Install** in the Install menu.

➋ Press the cursor down.
Follow the instructions on screen.

Note: Search or direct selection of a TV channel.
If you know the frequency, the C- or S-channel number, enter the 3 or 2 digits of the frequency or the channel number directly with the digit keys 0 to 9 (e.g. 048). Press the cursor down to proceed.

Repeat to search for another TV channel.

Give name



It is possible to change the name stored in the memory or to assign a name to a TV channel or external for which a name has not yet been entered. A name with up to 5 letters or numbers can be given to the programme numbers 0 to 99.

Note : It is not possible to rename the VGA source.

❶ Select **Give Name** in the Install menu and press the cursor down.

❷ Select the programme number.
Note: keep the cursor up/down pressed to scroll through the programme list quickly.

❸ Press the cursor right.
A keyboard appears on the screen.
Press the cursor right to enter the keyboard.
Press the cursor up/down, left/right to select the first character and press **OK**. Repeat for every character you want to enter.
Select **Space** to enter a space; **Delete** to erase the highlighted character in the name entered; **Shift** to display upper- or lowercase characters on the keyboard; **Special** to display special characters on the keyboard. Press **OK** to confirm.

❹ Press the cursor left repeatedly when you have finished the name giving.

❺ Select another programme number and repeat steps ❸ to ❹.

Reshuffle the programme list

You can change the order of the stored TV channels.

❶ Select **Reshuffle** in the Installation menu.

❷ Follow the instructions on screen.

Select Favourite TV channels

A VGA source always belongs to the list of **Favourite programmes**.

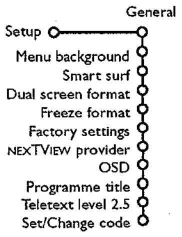
❶ Select **Favourite programmes** in the Install menu.

❷ Select your programme number with the cursor up/down.

❸ Select **Yes** or **No** with the cursor right.

❹ Repeat ❷ and ❸ for every TV channel or external you want to make a favourite or a non-favourite TV channel or external.

TV Setup



The Setup menu contains items that control the settings of the TV's functions, features, services and peripherals you may have connected.

The **General** menu allows you to change settings that will typically be accessed only occasionally.
The **Source** menu allows you to select a source.
The **Decoder** menu allows you to define one or more programme numbers as decoder programme numbers.

General

This menu allows you to change various settings that are presumably adjusted less frequently than most other settings.

Menu background

Select **Yes** or **No** to turn the menu background on or off.

Smart surf

❶ Select **Smart surf**.

❷ With the cursor right, select

- **2 programmes** if you want the P◂P key to toggle between the current and the previously selected channel,
- **9 programmes** if you want the P◂P key to summon a list of up to 9 channels which can be selected,
- **Themes** if you want the P◂P key to quickly select TV programmes if NEXTVIEW with defined themes is broadcast.

To add/remove a channel or source:

Tune to the channel or source you wish to add or remove. Press the P◂P key and press the cursor right to add or remove.
Note: If there are already 9 channels/sources in the list, the one at the bottom of the list will be removed.

Dual screen format

(not available for HD sources)
This menu allows you to select the preferred format which can then be displayed toggling the ⊞ key on and off.
See Dual screen/PIP/ Multipip, p. 14.

Select **Dual screen, PIP, Large PIP, Medium PIP** or **Small PIP, PIP 3, PIP 8** or **PIP 12** with the cursor up/down.

When Dual screen mode is activated with the remote control ⊞ key, and when:

- **Dual screen** is selected, the TV splits the screen into two equally sized screens.
- **Large PIP, Medium PIP** or **Small PIP** is selected, the TV shows a full screen of video with a small, medium or large window of video on top of it;
- **PIP3, PIP8** or **PIP12** is selected, the TV will display 3, 8 or 12 PIP screens.
Note : Continuing to hold the ⊞ key down will also cycle the TV through the Dual screen and the various PIP sizes.

Freeze format

This function is not possible with a VGA source. Freeze format allows you to select among three options: **Freeze, Replay** or **Photo finish**, to be activated when you press the ▶◀ key on the remote control. See p. 3.
Note: Continuing to hold the ▶◀ key down will also cycle the TV through the various formats. Changing the format this way does not store the selected format.

Factory settings

This resets the picture and sound settings to their predefined factory values, but maintains the channel installation settings.

NEXTVIEW provider

Select a TV broadcaster that provides NEXTVIEW data. How to make use of NEXTVIEW, see p. 15.

OSD (On Screen Display)

❶ Select **OSD**.

❷ Select **Normal** to activate extended channel and programme information. **Minimum** will display reduced channel information.
Note: When subtitles is switched on, see Features, p.13, display of the programme number is not possible

Programme title

Select **Programme title Yes** or **No**.
When selected **Yes**, after the selection of a TV programme or after pressing the ⓘ key on the remote control, a TV channel which broadcasts teletext may transmit the name of the TV channel or the programme title.
When selected **No**, the programme title will only appear after pressing the ⓘ key, and not after the selection of a TV channel.

Teletext level 2.5

Some broadcasters offer the opportunity to see more colours, other background colours and nicer pictures in the teletext pages.

❶ Select **Teletext level 2.5**.

❷ Press the cursor right to select **Teletext level 2.5 On** to take advantage of this feature.

❸ Press the cursor right again to select **Teletext level 2.5 Off** if you like the more neutral teletext layout.
The selection made is valid for all channels which broadcast teletext level 2.5.
Note: It may take a few seconds before teletext broadcast switches over to Teletext level 2.5.

Set/Change code

The Child lock feature (see TV, Features, p. 13) allows you to lock channels to prevent others from watching certain programmes. To watch locked channels, a 4-digit code must be entered. The Set/Change code menu item allows you to create or change a Personal Identification Number (PIN).

❶ Select **Set/Change code**.

❷ If no code exists yet, the menu item is set to **Set code**.
If a code has previously been entered, the menu item is set to **Change code**. Follow the instructions on screen.

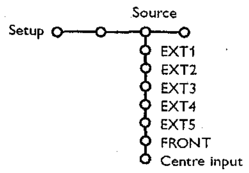
Important: You have forgotten your code !

❶ Select **Change code** in the General menu and press **OK**.

❷ Press the cursor right and enter the overriding code 8-8-8-8.

❸ Press the cursor again and enter a new personal 4-digit code. The previous code is erased and the new code is stored.

Source



This menu allows you to indicate the peripheral you connected to one of the external inputs.

❶ Press the cursor right to enter the list of types of peripherals attached to the selected input.

❷ Select the peripheral device with the cursor up/down.

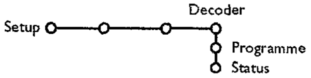
Once you have selected the source type, e.g. DVD, this source will automatically be selected when your remote control is in DVD mode, see p. 3, and when you press the ⊡ key on the remote control.

Centre input

(not available in combination with a speakerless monitor)

When you have connected a surround receiver to the TV, see p. 20, the loudspeakers of the TV can act as centre speaker, making a separate centre speaker unnecessary.
Select **Centre input On** or **CinemaLink** (in case you have connected a CinemaLink surround receiver).

Decoder



If a decoder or a descrambler is connected, see p. 19, you can define one or more programme numbers as decoder programme numbers.

❶ Select **Decoder** with the cursor right.

❷ Select **Programme**.

❸ Select the programme number under which you have stored the programme coming from your decoder.

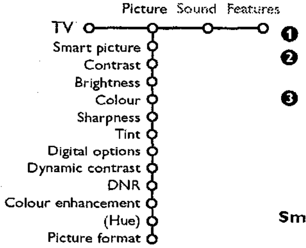
❹ Select **Status**.
- Select the input used to connect your decoder: **None, EXT1** or **EXT2**.
- Select **None** if you do not want the selected programme number being activated as a decoder programme number.

*Note: Select **EXT2** when the decoder is connected to your EasyLink video recorder.*

TV menu

Press the **MENU** key on the remote control to summon the main menu.

Picture menu



❶ Press the cursor right to select **Picture**.

❷ Select the menu items in the Picture menu with the cursor up/down.

❸ Adjust the settings with the cursor left/right or enter the list of submenu items with the cursor right. Select a submenu item with the cursor up/down.

Note: To remove the menu background before adjusting the picture settings, see Select TV setup, General, p. 8.

Smart picture

Select **Smart picture** to display a list of predefined picture settings, each corresponding with specific factory settings.
Personal refers to the personal preference settings of picture in the picture menu.
Note: Disabled when a VGA source is being displayed.

Contrast

This will adjust the intensity of bright parts of the picture but keep the dark parts unchanged.

Brightness

This will adjust the light output of the complete picture, which will mainly affect the darker areas of the picture.

Colour

This will adjust the saturation level of the colours to suit your personal preference.

Sharpness

This will adjust the sharpness of fine details in the picture.

Tint

This will adjust the general colour balance of the picture between cool and warm.

Digital options

Pixel Plus is the most ideal setting, doubles the horizontal resolution and increases the number of lines with 33%. You may consider to select Movie Plus in case a halo effect should disturb you. Dependent on your own preference, select Progressive scan.

Note: When 60 Hz NTSC material is used, the options are changed to Pixel Plus, Movie Plus or Progressive, progressive scan without motion compensation.

Dynamic contrast

Sets the level at which the TV automatically enhances the details in dark, middle and light areas of the picture.

DNR

This sets the level at which noise is measured and reduced in the picture.

Colour enhancement

This makes the colours more vivid and improves the resolution of details in bright colours.

Hue

This compensates for the colour variations in NTSC encoded transmissions.

Picture format

This will adjust the size of the picture dependent on the broadcast format and your preferred setting.

Active Control

The TV continuously measures and corrects all incoming signals in order to provide the best picture possible.

❶ Press the ⊠ key on the remote control.

❷ The Active Control menu appears.

❸ Press the cursor up/down to select the Active Control values **Off, Minimum, Medium** (recommended) or **Maximum**.
The picture settings are being optimised continuously and automatically which is displayed by bars. The menu items can not be selected.

Note: When having connected a monitor without a light sensor, the values are On and Off.

❹ Press the cursor right to select **Smart Picture**.

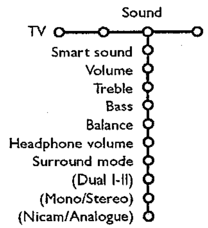
❺ Press the cursor up/down to select one of the predefined picture settings.

❻ Press the cursor right to select **Active Display**.

❼ Press the cursor up/down to select **Show bars**, one of the Dual screen demos or **Off**.
When you select Dynamic contrast, Pixel Plus, Digital Noise Reduction or Digital Natural Motion, the TV screen is divided into two parts: in the left part the selected picture quality setting is switched off; in the right part it is switched on.

❽ Press the ⊠ key again to switch off the Active Control menu.

Sound menu



❶ Select the menu items in the Sound menu with the cursor up/down.

❷ Adjust the settings with the cursor left/right.
Remember, control settings are at normal mid-range levels when the bar scale is centered.

Note:
- *In case of a Cinema Link configuration and the Cinema Link is activated, the menu function Surround mode is steered by the audio receiver instead of by the receiver box. See the separate Cinema Link booklet supplied.*
- *Dual I-II is only available with dual sound transmission.*
- *Mono/Stereo is only selectable in case of analogue stereo transmission.*
- *Nicam/Analogue is only selectable in case of Nicam transmission.*

Smart sound

Select **Smart sound** to display a list of predefined sound settings, each corresponding with specific factory settings of Treble and Bass. **Personal** refers to the personal preference settings of sound in the sound menu.
Note: Disabled when a VGA source is being displayed.

Volume

This will adjust the sound output level.

Treble

This will adjust the level of high frequency content in the sound.

Bass

This will adjust the level of low frequency content in the sound.

Balance

This will adjust the output of the right and left speakers to obtain the best stereo reproduction for your listening position.

Headphone volume

This controls the level of sound through the headphones.

Surround mode

This selects the modes for more spatial or surround sound reproduction.

(Dual I-II)

This will select, per channel, Language I or Language II, when dual sound transmission is available.

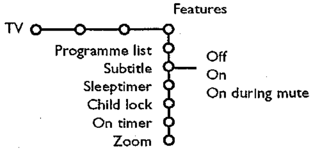
(Mono/Stereo)

This selects, per TV channel, mono or stereo sound when analogue stereo broadcasts are available.

(Nicam/Analogue)

This selects, per TV channel, Digital-Nicam or Analogue sound when digital sound broadcasts are available.

Features menu



❶ Press the cursor right to select **Features**.

❷ Select the menu items with the cursor up/down and adjust the settings with the cursor left/right.

Programme list

Press the **OK** key to switch over to the selected TV channel or external.

Select subtitles

The subtitle page must be stored for each TV channel:
Switch on teletext and select the proper subtitle page from the index. Switch off teletext.
Subtitle On will automatically display them on the selected TV channels if subtitles are in the transmission. A symbol will indicate that the mode is on.
Select **On during mute** when you want to have the subtitles automatically displayed only when the sound has been muted with the 🔇 key on the remote control.

Sleeptimer

With the sleeptimer you can set a time period after which the TV automatically switches to standby. The counter runs from 0 min. up to 180 min. You can always switch off your TV earlier or change the set time.
Note: When a VGA source is selected, the TV will not go to standby when the sleeptimer expires.

Child lock

The child lock feature allows you to lock TV channels and externals to prevent children from watching certain programmes.
A VGA source can not be locked.

❶ Select **Child lock**.

Child lock ○— Lock
Custom lock —— Age lock
Lock after
Programme lock
Category lock
Unlock

❷ Press the cursor right to enter the Child lock menu. You're summoned to enter your code.
Note: You have to re-enter your code each time you enter the child lock menu.
Important: You have forgotten your code ! See p. 9.

❸ Select one of the menu items of the child lock menu:

- **Lock** if you want to lock all channels and externals.
- **Custom lock** and press the cursor right.
  The items Age lock and Category lock are only available when NEXTVIEW broadcast is available.
  Select:
  - **Age lock** if you want to lock programmes related to a certain age: off, 2, 4 ... 18;
  - **Lock after** if you want to lock all programmes from a certain time onwards. Press the cursor right and enter the time with the cursor up/down and right. Press the **OK** key to validate.
  - **Programme lock** if you want to lock a certain TV channel or external;
  - **Category lock** if you want to lock programmes related to a certain theme: Movies, Sports, Shows.... See NEXTVIEW, p. 15.
- Select **Unlock** to disable all locks you have set.

On timer

With the On timer function you can make your TV automatically switch to a specific programme number from standby or switch over to a different programme number at a specific time.
Note: Your TV receiver box and your monitor should not be powered off with the ⏻ power key.

❶ Select **On timer** with the cursor down.

On timer ○— Off
On — VCR1
BBC2
CNN
TVE — Sunday
Monday
....
Daily —— 15:45
▶.....

❷ Select **On** with the cursor right.

❸ Press the cursor right again to enter the programme list.

❹ Select the TV channel or external you want your TV to switch to on a selected time and day.

❺ Press the cursor right again to select a day of the week or to select **Daily**.

❻ Press the cursor right once again to enter the time with the digit keys or with the cursor up/down and press the **OK** key to activate.

❼ Press the **MENU** key to turn off the menu.
Note: To check your timer settings, press the ⊞ key.

Zoom

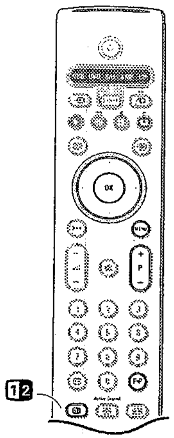
❶ Select **Zoom** with the cursor down and press the **OK** key.

❷ Press the **OK** key to select one of the zoom magnifications (x1, x4, x9, x16).

❸ Additionally you can shift the selected zoom window over the screen with the cursor keys up/down, left/right.

❹ Press the **MENU** key to switch off the zoom function.

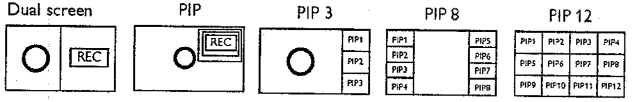
Dual screen / PIP / Multipip



Press the 12 key to switch on Dual screen or one of the PIP modes according to the format selection mode in the Dual screen format list in the General menu. See Setup, General, p. 8.
Press the 12 key again. The screen that has a yellow border will become the full main screen picture.

Notes:
- *Continuing to hold the 12 key down will cycle the TV through the various formats (Dual screen, Large PIP, Medium PIP, Small PIP, PIP 3, PIP 8 or PIP 12) launching a new format after each second the key is held down. After standby of the TV, the preference as set in the Setup, General menu is used.*
- *It is not possible to display a VGA or HD source in a Dual screen/PIP screen.*
- *When Dual screen mode is selected, two picture formats are supported: Full screen or 4:3 letterbox picture format (vertical squeeze).*
- *Audio from the right screen or the PIP plays to the headphones.*

Display options



- Press the cursor right to highlight the right screen.
- Press the cursor down to highlight the single (large, medium or small) PIP screen.
- Press the cursor right to enter the Multipip screen and then use the cursor keys to navigate through the PIP screens and to highlight a PIP screen.

Changing TV channels or external sources in left, right, PIP or Multipip screen

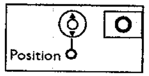
Press the **-P+** key or the P◂P key or the digit keys in order to change the TV channels or external sources in the highlighted screen.

Scan PIP 3, PIP 8 or PIP 12

Navigate to the lowest PIP to display and press the cursor down to display a following series of PIP screens.

Define the position of the single PIP screen

❶ Select a Dual screen mode with a single PIP screen.



❷ Press the cursor down to highlight the PIP screen. A PIP menu appears with which you can define the position of the PIP screen.
*Note: When the PIP menu is timed out, press the **OK** key to make it reappear.*

❸ Press the cursor down again to select **Position.**

❹ Press the **OK** key or the cursor right to activate.

❺ Use the cursor keys to define the position of the PIP screen.

❻ Press the **OK** key. The PIP menu reappears.

❼ Press the cursor up twice to highlight the main screen again and press the **OK** key to switch off the menu.

On-Screen information

The highlighted On-Screen information, which appears when changing channels, always refers to the active screen.

NEXTVIEW / Teletext guide

NEXTVIEW is an electronic guide that allows you to look up programmes as you would in a newspaper or a TV magazine. You can sort the programmes by subject (films, sport...), obtain detailed information and programme your video recorder if it comes with the NEXTVIEWLink function.

Important note: ***The NEXTVIEW service is only available on certain programmes and in certain countries.*** *When no NEXTVIEW information is broadcast, the teletext programme guide appears in its place. This is based on teletext programme information (if available) and offers most functions of NEXTVIEW.*
Note: The broadcaster is responsible for the content of the information.

Call NEXTVIEW / Teletext guide

Press the ⊡ key on the remote control to call the nexTView/Teletext guide. A menu appears with the message **One moment please**. After a while you obtain:

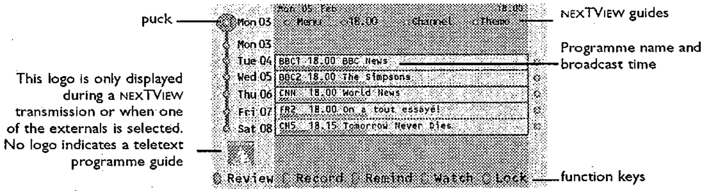
- a NEXTVIEW page, if the selected channel broadcasts this service (the NEXTVIEW logo is displayed),
- a teletext page, if the selected channel does not broadcast NEXTVIEW,
- **No information available** is displayed if neither NEXTVIEW nor teletext are transmitted. In this case, select another channel.

Select TV channels by theme

If NEXTVIEW with defined themes is broadcast, it is possible to quickly select TV programmes with the P◂P key. See Setup menu, General, Smart surf, p. 8.

Display of a NEXTVIEW page

The information is set by the channel that transmits the nexTView service. See also Setup menu, General, NEXTVIEW provider, p. 8.


puck
Mon 05 Feb
18.00
Mon 03
< Menu
<18.00
<Channel
<Theme
Mon 03
Tue 04
Wed 05
Thu 06
Fri 07
Sat 08
BBC1 18.00 BBC News
BBC2 18.00 The Simpsons
CNN 18.00 World News
FR2 18.00 On a tout essayé!
CH5 18.15 Tomorrow Never Dies
Review
Record
Remind
Watch
Lock
NEXTVIEW guides
Programme name and broadcast time
function keys
This logo is only displayed during a NEXTVIEW transmission or when one of the externals is selected. No logo indicates a teletext programme guide

Picture/NEXTVIEW - Teletext Guide

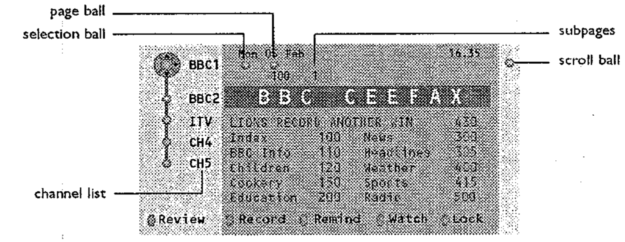
❶ Press the ⊡ key. Press the 1|2 key to show NEXTVIEW-Teletext Guide on the right of the screen.
❷ Use the cursor keys to select a TV channel or to move the puck to the blue ball in the left screen.
❸ Press the 1|2 key to switch off dual screen.

NEXTVIEW guides

❶ Use the cursor key left/right to select **Time, Channel, Theme,** the **Date** guide.
The **Time guide** provides an overview of all programme titles active in the selected time block. The **Channel guide** provides an overview of all programmes that are broadcast by a single channel during one day. With the **Date guide** you can choose a specific date. The **Theme guide** displays a list of all programmes at the selected date, that matches with the selected category.
Going through the menu guide, the TV is collecting the sorting criteria to finally display a list of programme events.
❷ Press the **OK** key to select the guide type.
❸ Move the puck down and to the right to select the programmes.
If available a summary or commentary on the programme is displayed at the bottom of the screen.
❹ Use the cursor up/down to scroll through the programmes.

Teletext Guide

❶ Enter with the digit keys, the teletext page number that contains the programme information for the current channel.
❷ Press the cursor right to move the puck over the selection ball.
❸ Use the cursor up/down to scroll through the different programmes.


page ball
selection ball
subpages
scroll ball
channel list
BBC1
BBC2
ITV
CH4
CH5
Mon 05 Feb
16.35
100
1
B B C C E E F A X
Index 100
News 300
BBC Info 110
Headlines 305
Children 120
Weather 400
Cookery 150
Sports 415
Education 200
Radio 500
Review
Record
Remind
Watch
Lock

- If the selected programme contains a page number with an optional subcode referring to a page with more info about the programme, press the **OK** key to display the information. Press the **OK** key again to return to the programme guide page.
- If the selected programme guide page satisfies the VPT requirements,
  - it will be possible to record, remind, watch or lock programmes:
  - the TV will remember the last selected teletext page number of that channel that contains programme guide information and indicates which programme starts at what time. Every time you press the ⊡ key, the teletext programme guide page of the selected TV channel will be available.
- When necessary you can select the subpage number by moving the cursor to the pageball and pressing right.

Note: You must enter the teletext pagenumber for each channel. You can change the channels also by moving the cursor up/down in the list in the left of the page.

Basic functions

Press one of the grey ◯, red ●, green ⊚, yellow ⁑ or blue ⊡ keys to activate a NEXTVIEW or Teletext Guide function. The keys appear in grey if the function is not available.
Review: this menu provides a list of programmes that are marked as reminders, those that have to be recorded and those that are locked. This menu can be used to change or remove marked programmes.
Record: to programme the recording of the video recorder (if it has a NEXTVIEWLink function and is connected to **EXT. 2**).
Remind: automatically switch on the TV if it is in standby or by displaying a message if the TV is on.
Lock: to lock certain programmes to prevent recording or watching.
For the functions Record, Remind or Lock, a small menu pops up in which you can choose the interval: once, daily or weekly, or clear an earlier made record, remind or lock setting. The default interval is set to **Once**. To confirm the frequency, press the **OK** key.
Watch: to watch the selected and currently broadcast programme.

Acquisition and updating of NEXTVIEW information

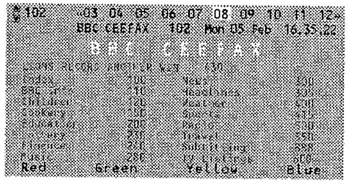
Acquisition and updating of NEXTVIEW is done when you are watching the TV channel of the selected NEXTVIEW provider, see Setup menu, p. 8, or when the TV is switched to standby;
Acquisition of fresh data will happen once during the night.
Note: it may be necessary to put the TV in standby mode when all NEXTVIEW information is outdated, e.g. when returning from holiday.

Teletext

Most TV channels broadcast information via teletext. This TV has a 1200 pages memory that will store most broadcasted pages and subpages to reduce waiting time. After each programme change, the memory is refreshed.

Switch Teletext on and off

Press ▤ to switch the teletext on.



Select a Teletext page

- Enter the desired page number with the digit keys, the cursor keys up/down, left/right or with the **-P+** key.
- Select the options at the bottom of the screen with the colour keys.

Previously selected teletext page

(Only possible in case there is no list of favourite teletext pages available. See p. 18.)
Press the P◁P key.

Select the index teletext page

Press the grey colour key ▶▶ to display the main index (usually p.100).

Only for T.O.P teletext broadcasts :

Press ⊕. A T.O.P. overview of the teletext subjects available is displayed.
Select with the cursor up/down, left/right the desired subject and press the **OK** key.
Not all TV channels broadcast T.O.P. teletext.

Select subpages

When a selected teletext page consists of different subpages, a list of available subpages appears on the screen.
Press the cursor left or right to select the next or previous subpage.

Enlarge a Teletext page

Press ⊞ repeatedly to display the upper teletext part, the lower teletext part and then to return to the normal teletext page size.
When the teletext page is enlarged, you can scroll the text, line by line using the cursor up/down.

Active screen selection

When in dual screen picture/teletext, enter the desired page number with the **-P+** key, then press the **MENU** key, then select the left screen (with the blue ball at the top).
You can now select a compressed or full screen view of picture/teletext with the ⊞ key.

Hypertext

With hypertext you can quickly jump to a pagenumber or search for a specific word shown on the current teletext page.

❶ Press the **OK** key to highlight the first word or a number on the page.
Note: When in dual screen mode, press the cursor down to highlight the first word or page number.

❷ Use the cursor up/down, left/right to select any other word or number you want to search for.

❸ Press the **OK** key to confirm. The search starts. A message appears at the bottom of the screen to indicate the searching, or that the word or page is not found.

❹ Use the cursor up to exit hypertext.

Teletext menu

(only available in full screen teletext mode)

❶ Press the **MENU** key to activate the menu.

❷ Press the cursor up/down to select the menu items.

❸ Press the cursor right to activate.

Reveal

Reveals/conceals hidden information on a page, such as solutions to riddles and puzzles.
Press the cursor right to activate.

Favourite

This list contains up to eight favourite teletext pages. Only the pages of the current channel can be selected.

❶ Press the cursor right to enter the list.

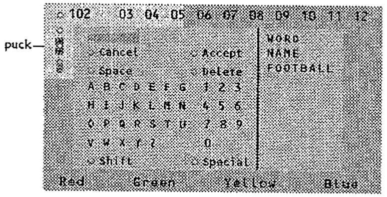
❷ Press the cursor right again to add the current page or to select one of the favourite pages to the list.

❸ Press the **MENU** key to watch the page.

❹ Use the P◁P key to browse through the list of favourite pages.

Search

Selecting a word
On the keyboard on screen you can type in a random word you want to search for in the teletext pages. Whether upper- or lowercase is used has no influence.



❶ Press the cursor right to enter the keyboard.

❷ Press the cursor left/right, up/down to select the characters, words or functions.

❸ Press the **OK** key to confirm each character selected.

❹ Select **Cancel** to cancel the word; **Space** to enter a space; **Delete** to delete the last character selected; **Shift** to switch between lowercase or capital characters; **Special** to display special characters on the keyboard and press the **OK** key.

❺ Press the cursor left repeatedly to return to the Teletext menu again.

Searching a word

❶ Type in the word on screen or select a word from the history list on the right and press **OK**.

❷ Select **Accept** and press **OK** again. The message Searching appears.

❸ To cancel the searching or to search for a new word, select **Keyboard** and press **OK**.

❹ When a word is not found, a message appears. When the word is found, it is highlighted in the teletext page. To continue the search, press the **OK** key.

Cycle subpages *(if available)*

Makes the subpages cycle automatically.
Press the cursor right to activate and to de-activate again.

Timed page

To display a specific page from a selected TV channel at a certain time.

❶ Press the cursor right and select **Yes** or **No**.

❷ Enter the time and pagenumber with the cursor keys or the digit keys.
Notes:
- *Teletext does not have to remain switched on, but you should watch the TV channel you have selected the specific page from.*
- *It is not possible to display a timed page when in VGA mode.*

❸ Press the cursor left to return to the TV menu again.

Language

If the displayed characters on screen do not correspond with the characters used by the teletext broadcaster, you can change the language group here.
Select **Group 1** or **Group 2** with the cursor right.

Press the **MENU** key to leave the Teletext menu.

Connect Peripheral Equipment

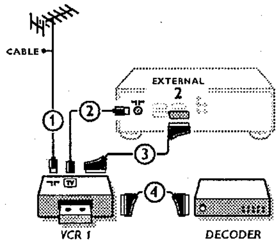
There is a wide range of audio and video equipment that can be connected to your receiver.
The following connection diagrams show you how to connect them.

Note: In case of the monitor in a stand alone situation without the receiver box connected, see the instructions with the monitor.
Note: ***EXT1*** *can handle CVBS and RGB,* ***EXT2*** *CVBS, Y/C and RGB,* ***EXT3*** *and* ***4*** *CVBS,* ***EXT5*** *Y-Pb-Br. It is preferred to connect peripherals with RGB output to* ***EXT1*** *or* ***EXT2*** *as RGB provides a better picture quality.*

Note: If your recorder is provided with the EasyLink function, it should be connected to ***EXT2*** *to benefit from the EasyLink functionality.*

Recorder (VCR-DVD+RW)

Note: Do not place your recorder too close to the screen as some recorders may be susceptible for signals out of the display. Keep a minimum distance of 0,5 m to the screen.

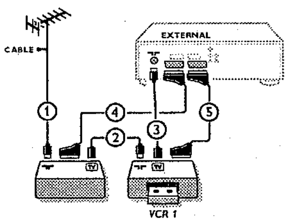


Connect the aerial cables ①, ② and, to obtain the optimum picture quality, eurocable ③ as shown.
If your recorder does not have a euroconnector, the only possible connection is via the aerial cable. You will therefore need to tune in your recorder's test signal and assign it programme number 0 or store the test signal under a programme number between 90 and 99, see Manual installation, p. 6.
See the handbook of your recorder.

Decoder and Recorder

Connect a eurocable ④ to your decoder and to the special euroconnector of your recorder. See also the recorder handbook. See Decoder, p. 10. You can also connect your decoder directly to **EXT1** or **2** with a eurocable.

Other equipment (satellite receiver, decoder, DVD, games, etc.)

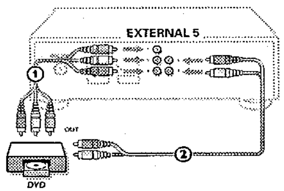


❶ Connect the aerial cables ①, ② and ③ as shown (only if your peripheral has TV aerial in-/output).
Connect your equipment with a eurocable ④ or ⑤ to one of the euroconnectors **EXT1, 2, 3** or **4** to obtain a better picture quality.

❷ Look for the test signal of your peripheral in the same way as you do for a recorder.

❸ Make a selection in the Setup, Source menu, p. 9.

DVD player

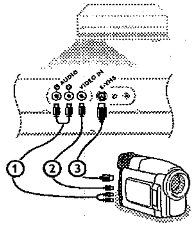


With Component Video Output Connectors (EXTERNAL 5)

❶ Connect the three separate component video cables to the DVD player's **Y, U** (Pb) and **V** (Pr) jacks and to the **Y, Pb** and **Pr** jacks on the receiver.

❷ Connect the audio cable to the DVD player's **AUDIO L** and **R** jacks and to the **L** and **R AUDIO EXTERNAL 5** jacks on the receiver.

Side connections



Camera or Camcorder

❶ Connect your camera or camcorder as shown.

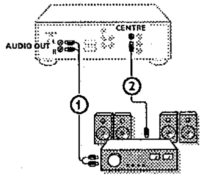
❷ Connect to **VIDEO** ② and **AUDIO L** ① for mono equipment. For stereo equipment also connect **AUDIO R** ①.
S-VHS quality with an S-VHS camcorder is obtained by connecting the S-VHS cables with the S-video input ③ and audio inputs ①.
Do not connect cable ② and ③ at the same time. This may cause picture distortion !

Headphone

❶ Insert the plug into the headphone socket 🎧 as shown.

❷ Press 🔇 on the remote control to switch off the internal loudspeakers of the TV.
The headphone impedance must be between 8 and 4000 Ohm. The headphone socket has a 3.5 mm jack.
In the Sound menu select **Headphone volume** to adjust the headphone volume.

Multi channel Surround receiver



❶ Connect the audio cable to the multi channel Surround receiver and to **AUDIO OUT L** and **R** at the back of your TV receiver box ①.

❷ If you want the loudspeakers of your monitor to act as centre speaker, also connect an audiocable to the multi channel Surround receiver and to the **SURROUND SOUND CENTRE IN** at the back of your TV receiver box ②.

❸ Select **Centre Input On** in the Source menu. See p. 9.
The loudspeakers of the monitor will now only produce centre sound, the loudspeakers connected to the audio receiver will produce Surround Sound. The volume has to be controlled via the multi channel Surround receiver.

Note: No sound will be heard when a TV channel or external source is blocked via the Child lock menu (see p. 13).

Cinema Link surround receiver

See the separate supplied Cinema Link instruction manual.

Attention: the sound info on screen will not correspond with the actual sound reproduction.

Connect your computer

See the separate supplied instruction manual with your monitor.

To select connected equipment

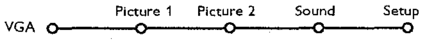
Press the ⊕ key on the remote control repeatedly to select **EXT1, EXT2, EXT3, EXT4, EXT5, FRONT** or **VGA** according to where you connected your equipment at the back or the front side of your receiver.

Remark : Most equipment (decoder, recorder) carries out the switching itself, when it is switched on.

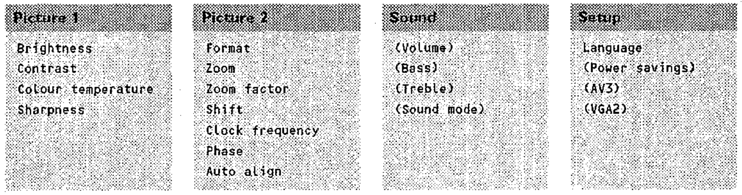
VGA menu

Only available when a VGA source has been connected and activated. See also the separate supplied instruction manual with your monitor.

❶ Select **VGA** with the ⊕ key and press the **OK** key to confirm.
❷ Press the **MENU** key to switch on the **VGA** menu.



❸ Select one of the menus with the cursor left/right.
❹ Select one of the menu items with the cursor up/down.
See the separate booklet supplied with the monitor.

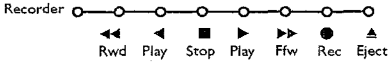


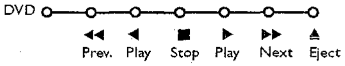
Picture 1	Picture 2	Sound	Setup
Brightness	Format	(Volume)	Language
Contrast	Zoom	(Bass)	(Power savings)
Colour temperature	Zoom factor	(Treble)	(AV3)
Sharpness	Shift	(Sound mode)	(VGA2)
	Clock frequency		
	Phase		
	Auto align		

❺ Press the cursor left/right to alter the selected adjustment.
❻ Press the **MENU** key again to switch off the **VGA** menu.

Recorder or DVD with EasyLink

The recorder (VCR or DVD+RW) or DVD can be operated with the remote control via the **Recorder** or **DVD** menu on screen.

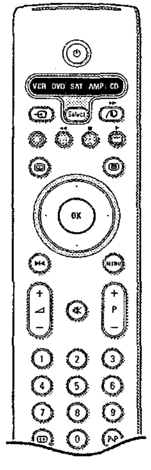




❶ Press the **MENU** key on the remote control.
❷ Select the **Recorder** or **DVD** menu with the cursor up/down.
❸ Press the cursor left/right, up/down to select one of the recorder or DVD functions.

The key ● for recording can be operated in the TV mode.
If your EasyLink recorder has the system standby function, when you press the ⏻ key for 3 seconds, both TV and the recorder are switched to standby.

Audio- and video equipment keys



Most of the audio and video equipment from the Philips range of products can be operated with the remote control of your TV.

Press the **Select** key to operate any of the equipment indicated in the display. Another device can be selected by pressing Select repeatedly within 2 seconds. The led will blink slowly to indicate the device.
Press one of the keys on the remote control to operate the peripheral equipment.
To return to TV mode press **Select** while the led is blinking.
When no action is taken within 60 seconds, the remote goes back to TV mode.

Note: When the Select key is pressed and hold for more than 2 seconds, the RC5/RC6 system select command is transmitted.

⏻	to switch to standby
▶◀	for pause (**VCR, DVD, CD**)
●	for record
◀◀	for rewind (**VCR, CD**); search down (**DVD, AMP**)
■	for stop
▶	for play
▶▶	for fast forward (**VCR, CD**); search up (**DVD/AMP**)
▣	to select your choice of subtitle language (**DVD**); RDS news/TA (**AMP**); to shuffle play (**CD**)
▤	to select a **DVD** title; RDS display (**AMP**); info on screen (**CD**)
⊞	display information
MENU	to switch the menu on or off
- P +	for chapter, channel, track selection
0 to 9	digit entry
P‹P	tape index (**VCR**), select a DVD chapter, select a frequency (**AMP**)
⊙	VCR timer
⤧	surround on/off (**AMP, CD**)
cursor up/down	to select the next or the previous disc (**CD**)
cursor left/right	to select the previous or following track (**CD**) search up/down (**AMP**)

Selecting submodes for DVD+RW, SAT, CDR

❶ The remote control should be in TV mode.
❷ Press the **OK** key together with

- digit 1: **DVD** mode is selected
- digit 2: **DVD+RW** mode is selected
- digit 3: **SAT (RC5)** mode is selected
- digit 4: **SAT (RC6)** mode is selected
- digit 5: **CD** mode is selected
- digit 6: **CD-R** mode is selected.

Record with your recorder with EasyLink

In TV mode, it is possible to start a direct recording of the programme which is being displayed on the TV screen.
Continue to press the ● record key on the remote control for more than 2 seconds.

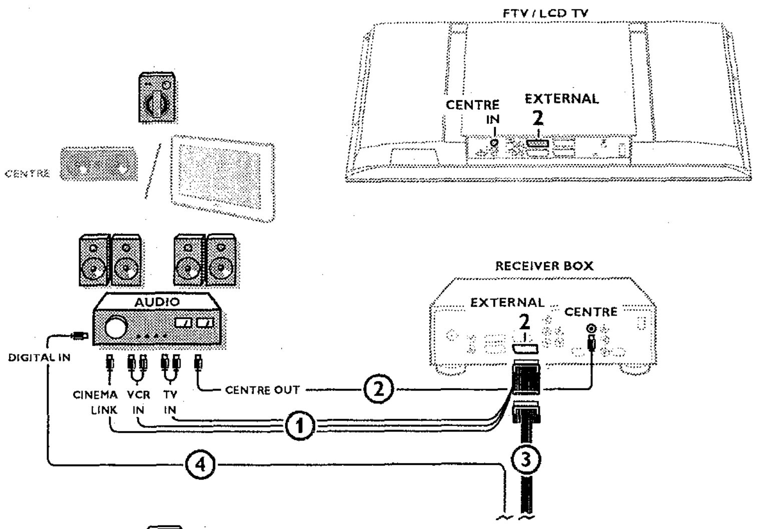
Note:
Switching programme numbers on your TV does not disturb recording !
*When recording a programme from a peripheral connected to **EXT. 1, EXT. 3, EXT. 4, EXT. 5** or **FRONT**, you can not select another TV programme on the screen.*

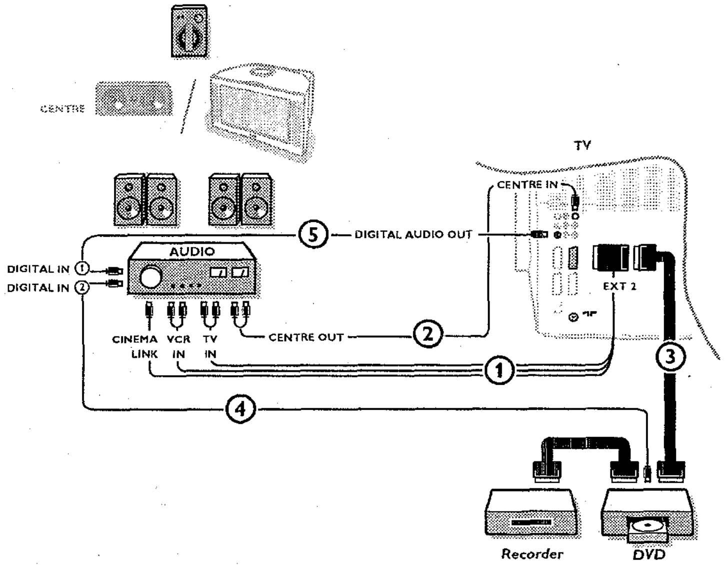
Attention:
Recording from EXTERNAL 5 will only have black and white pictures !

Tips

Poor Picture	• Have you selected the correct TV system in the manual installation menu? • Is your monitor or house aerial located too close to loudspeakers, non-earthed audio equipment or neon lights, etc.? • Mountains or high buildings can cause double pictures or ghost images. Sometimes you can improve the picture quality by changing the direction of the aerial. • Is the picture or teletext unrecognisable? Check if you have entered the correct frequency. See Installation, Manual installation, p. 6. • Are brightness, sharpness and contrast out of adjustment? Select Factory settings in the Setup, General menu, p. 8.
No Picture	• Are the supplied cables connected properly ? (The aerial cable to the receiver box, the other aerial to your recorder, the VGA cables to the display, the power cables.) • Has the child lock been switched off ? • Is your PC switched on ? • Do you see a black screen and the indicator in front of the monitor lights up green, this means that the display mode is not supported. Switch your VGA-source to a correct mode. • In case of weak or bad signal, consult your dealer.
Digital distortion	The low quality of some digital picture material may be the cause of digital image distortion. In this case select the Soft setting using the Picture menu, Smart Picture, without changing the picture settings manually.
No sound	• No sound on any channel? Check the volume isn't at minimum. • Is the sound interrupted with the mute key 🔇?
No Surround sound	• Check if the headphone is not plugged in. • Perhaps the channel is not broadcasting good quality surround sound. • No sound from the rear speakers or the centre speakers? Select an appropriate surround mode, according to the broadcasted sound signal or adjust the volume. See Surround Modes, p. 12.
No solution found for your picture or sound problem ?	Switch your TV off and then on again once. Never attempt to repair a defective TV yourself. Check with your dealer or call a TV technician.
Menu	Have you selected the wrong menu? Press the **MENU** key again to exit from the menu.
NEXTVIEW	**Orange indicator on front of the TV during standby / No NEXTVIEW info:** See Acquisition and updating of NEXTVIEW information, p. 16. **Displayed time is wrong:** The broadcaster on programme number one does not transmit the correct local date and time. Use Reshuffle in the installation menu to place another broadcaster on programme number one.
Remote control	• Check if the remote control is in the correct mode. • If your TV no longer responds to the remote control, the batteries may be dead. • You can still use the **MENU** key and the -/+ keys in front of the receiver

Standby	Your TV consumes energy in the standby mode. Energy consumption contributes to air and water pollution.
No stable or not synchronised VGA picture	Check if you have selected the correct VGA mode in your PC. See the separate instruction manual with the monitor.
TV receiver box with speakerless monitor	In case you connect your TV receiver box with a speakerless monitor, and without having connected an audio receiver, all references made in this instruction book to sound reproduction, volume control, and audio connections, are not applicable (except for a headphone connection). The keys on the remote control referring to sound have no function either.
Miscellaneous	. Ambient temperature: + 5~ + 40°C . Mains: 50/60 Hz Auto Voltage ranging from 95 V to 264 V . Power consumption: around 300 W . Standby consumption: 2 W . Weight (excl. packaging): 4 kg . Dimensions (wxhxd): Receiver: 43.5 x 10.5 x 33 cm





Note: The Cinema Link functionality is only available with devices of the Cinema Link (P50.3) generation !

Cinema Link is a new Philips feature in which the TV, the audio receiver and other video peripherals communicate with each other (on condition they all are equipped with the Cinema Link functionality and are connected via a eurocable). They automatically offer the highest quality combination of picture and multi channel surround sound to create your own Home Cinema.

With one key on the remote control, with which you can control all Cinema Link products, your total Cinema Link system will be started and the DVD or video recorder will start to play and the audio receiver will provide the sound (on the condition Cinema link is enabled) on behalf of the TV.
The TV or monitor can function as the centre speaker of your system, making a separate centre speaker unnecessary (only in case your TV or receiver box is equipped with a Centre IN connector).
By pressing the standby key ⏻ on the remote control for at least 3 seconds, the complete Cinema Link system will be switched to standby.

Recommended:

Do not use the AC outlet at the back of the audio receiver to power the DVD or the video recorder in a Home Cinema configuration.

Configuration of the Cinema Link peripherals

The connection diagram in the inside cover shows you how to connect the Cinema Link peripherals with each other.
Notes:

- *Besides the TV or receiver box at least one peripheral should be provided with the Cinema Link functionality to benefit from this feature.*
- *To take advantage of the highest quality of multi channel Surround sound it is advisable that you have a Cinema Link audio receiver connected.*
- *The peripherals connected don't need to see the TV remote control in the Cinema Link system. The commands given to the TV are automatically passed to the other peripherals. This allows you to put the peripherals behind the doors of a cabinet or to place them in another room.*
- *To enjoy Digital Surround playback, the digital device (e.g. DVD) should be connected to the digital input of the audio receiver with a separate cinch audio cable ④. In case your TV is provided with a DIGITAL AUDIO OUT connector, also connect it to one of the digital input connectors of your audio receiver ⑤. If you connect the digital audio output connector of your TV and/or peripheral equipment to a digital input connector of your audio receiver ④ and ⑤ (if present), select the appropriate digital input (1 or 2) in your audio receiver.*
- *The optional wireless speakers of the TV cannot be used.*

Preparation and Operation

❶ Cinema Link is switched on as soon as the audio receiver and the TV are switched on. If necessary, Cinema Link may be switched off or on again only on the audio receiver. See the instructions for use of your audio receiver.
Important: When Cinema Link is switched on all audio commands control the audio receiver instead of the TV.

❷ The message **CINEMALINK ON** is displayed on the audio receiver and on the TV. Now the CinemaLink system is activated.
Note: it is recommended to disable CinemaLink when the receiver is used to record a CD e.g. or when using a headphone when others are watching TV.

Now you can adjust the initial TV settings for optimal surround sound and install the audio channels before starting up one of the CinemaLink devices. The system information about country choice, menu language and picture format you set up during the installation of the TV is transferred to the audio receiver automatically.

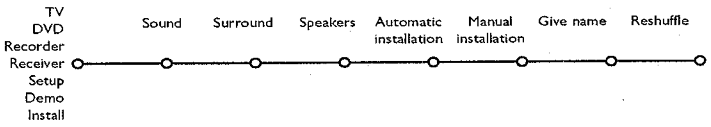
TV as centre speaker (only in case your TV or receiver box is equipped with a Centre IN connector)
See the Instructions for Use of the TV or receiver box, Setup, Source menu, Centre input.
Use the test tone function in the Speakers menu to have a reference of the loudness of the separate speakers.
Note: If you want the loudspeakers of your TV or monitor to act as centre speaker, also connect a cinch audio cable (not supplied) ② to the CENTRE IN connector of your TV or receiver box.

Activating CinemaLink

Continue to press the ▭-key on the remote control for more than 4 seconds.

① The TV or receiver box sends a play command to the Cinema Link DVD player, if present.
② The DVD player will start playing and the audio receiver automatically switches to the best Cinema Link sound.
③ If no DVD player is connected or if the DVD player has no disc loaded, the command can not be executed.
④ The TV or receiver box will then send a play command to the Cinema Link video recorder, if present.
⑤ The video recorder will start playing and the audio receiver selects the best Cinema Link sound.
⑥ If no video recorder source is connected or tape is loaded, the TV or receiver box will select the last watched TV channel.

Receiver menu


TV
DVD
Recorder
Receiver
Setup
Demo
Install
Sound
Surround
Speakers
Automatic installation
Manual installation
Give name
Reshuffle

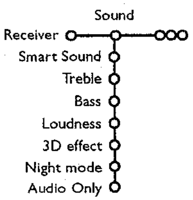
Note: When Cinema Link is enabled, certain items of the Sound menu (see TV menu) are steered by the audio receiver instead of by the TV or receiver box.

① Press the **MENU** key on the remote control.
② Press the cursor down to select **Receiver**.
③ Press the cursor right to enter the Receiver menu items.
④ Press the cursor up/down to select the submenu items.

Note: the audio receiver submenu items may only be selected if provided by the audio receiver (dependent on the configuration setup and the sound signals transmitted).

Sound menu

Dependent on the audio receiver speakers configuration, you may not be able to select certain menu items.


Sound
Receiver
Smart Sound
Treble
Bass
Loudness
3D effect
Night mode
Audio Only

Smart Sound, Treble, Bass

See the Instructions for Use for the TV or receiver box.

Loudness

When **Loudness On** is selected and when listening at low volume, the low and high frequencies are amplified so that the natural balance is restored.

3D effect

3D effect enables you to experience the effect of Dolby Surround Pro Logic without the need of having rear speakers connected or activated.
Select the level of 3D effect with the cursor left/right.

Night mode

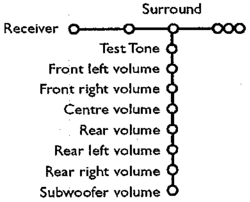
Night mode *(only functional with Dolby Digital sound broadcasting input)*
The loud parts of the sound are lowered and the soft passages are raised.
You can enjoy surround sound without disturbing sleeping children or neighbours.

Audio only

This control enables you to blank the TV picture if the TV or monitor is used as centre speaker in the Cinema Link system and if the audio receiver is reproducing sound unrelated to a TV picture.
Switch **Audio only On** to only hear the sound and to switch off the picture.
The message **Audio only** appears on screen.

Surround menu

Dependent on the audio receiver speakers configuration, you may not be able to select certain menu items.


Surround
Receiver
Test Tone
Front left volume
Front right volume
Centre volume
Rear volume
Rear left volume
Rear right volume
Subwoofer volume

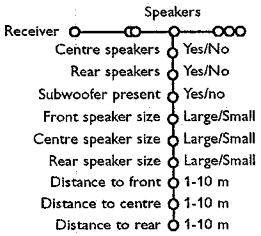
Adjustment of the volume level of the loudspeakers

Note: the test tone function is automatically cancelled by the audio receiver when leaving the Surround menu.

① Select **Test Tone On**.
A steady noise tone is switched sequentially through the available loudspeakers, except for the subwoofer, for 2 seconds each. This enables you to have a reference of the loudness of each loudspeaker and to adjust the level of each until they all sound equally loud.
The loudspeakers activated light up in the screen graphic.
② Select the Surround menu items with the cursor up/down one after another and alter the selected adjustments with the cursor left/right.
The best result is achieved when all speakers have equal volume in your usual listening position.
③ Select **Test tone Off** when you have finished the adjustment of the speaker levels.

Speakers menu

Dependent on the audio receiver speakers configuration, you may not be able to select certain menu items.
Once the number and position of the loudspeakers has been fixed, selecting Centre speaker, Rear Speakers and Subwoofer Yes or No, you can adjust the initial receiver settings, size and distance, for optimal surround sound.
Note: after changing the configuration, the menu will disappear temporarily and re-appear again after the new settings will be updated.


Speakers
Receiver
Centre speakers
Yes/No
Rear speakers
Yes/No
Subwoofer present
Yes/no
Front speaker size
Large/Small
Centre speaker size
Large/Small
Rear speaker size
Large/Small
Distance to front
1-10 m
Distance to centre
1-10 m
Distance to rear
1-10 m

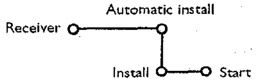
Size of the speakers

Select **Small** if your speaker is able to reproduce low notes down to at least 80-100 Hz. Select **Large** if your speaker is able to reproduce low notes down to at least 50 Hz.
Note:
- *As a rule of thumb, a large speaker has a cone diameter of at least 12 cms (5 inches). See the specification sheet of your loudspeakers.*
- *If Subwoofer present is set to No, Front speaker size can only be set to Large. If Front speaker size is set to Small, Centre speaker size can only be set to Small and consequently a subwoofer must be connected.*

Distance to the speakers

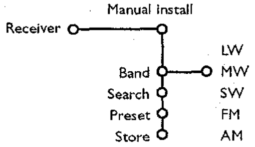
Select the distance from your usual listening position to the available speakers each; front, centre and rear speakers.
This defines the delay time for the surround sound.

Automatic installation


Automatic install
Receiver
Install
Start

In the Automatic installation menu select **Start** to activate the automatic searching of all radio stations which can be received.
The programme list is automatically filled with all the numbers and names of the radio stations transmitted.

Manual installation


Manual install
Receiver
Band
Search
Preset
Store
LW
MW
SW
FM
AM

You can also search for a known radio station by keying in the frequency.

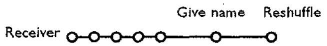
① First select **Band** to switch to the desired waveband: **LW**, **MW**, **SW**, **FM** or **AM**.

② Select **Search** and press the cursor right.
The frequency increases until a radio station is found.
If you know the 3-digit frequency, enter it directly with the digit keys 0 to 9.
Select **Preset** to enter the preset number using a three digit entry with the digit keys.

③ To store your radio station, select **Store** and press the **OK** key.

④ Repeat steps ① to ③ to store another radio station.

Give name - Reshuffle


Give name
Reshuffle
Receiver

To assign or change a name to a radio station or to change the order of the stored radio stations according to your preference, act in the same way as with giving a name or reshuffling the programme list of TV channels.
See the Instructions for Use of the TV or receiver box.

Personal Notes:

4. Mechanical instructions

Index of this chapter:

1. Disassembly and Panel Overview
    1. Top Cover Removal
    2. Panel Overview
2. Service Positions and Panel Removal
    1. Front I/O Panel
    2. Double Window Panel (if present)
    3. Power Supply Panel
    4. Feature Box Module
    5. Small Signal Panel
    6. Down Scaler Panel (if present)
    7. Audio/Video Interface Panel
    8. High Definition Panel
    9. 3D Comb Panel (US only)
3. Re-assembly

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Disassembly and Panel Overview

4.1.1 Top Cover Removal

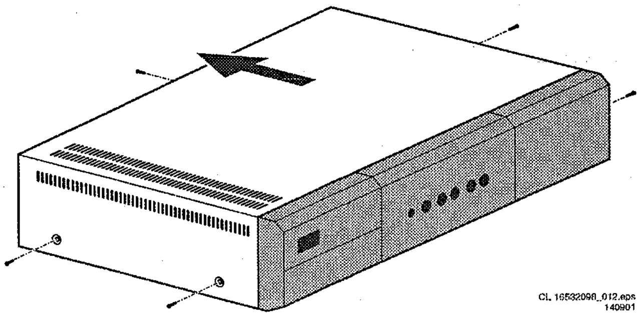
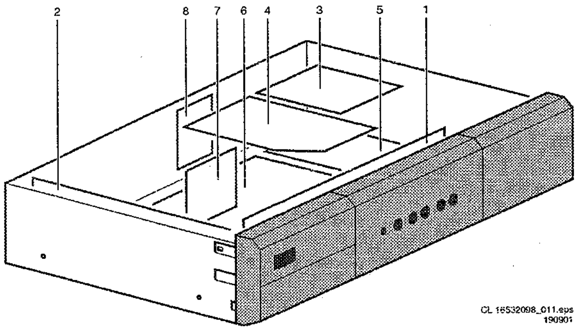

CL 16532098_012.eps
140901

Figure 4-1 Top cover removal

1. For safety reasons, first unplug the mains cable.
2. Remove all screws from the metal top cover.
3. Remove the metal top cover.

4.1.2 Panel Overview



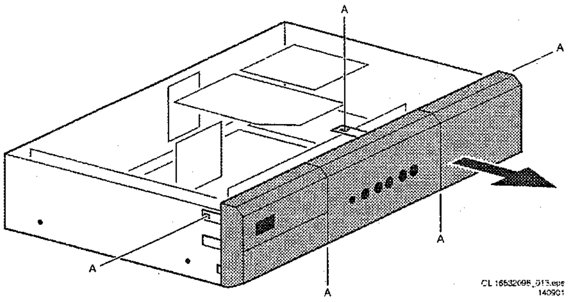
CL 16532098_011.eps
190901

Figure 4-2 Panel overview

1. Front I/O.
2. Power Supply.
3. Double Window Panel (if present).
4. Feature Box.
5. Small Signal Panel.
6. Audio Video Interface.
7. Down Scaler panel (if present).
8. High Definition panel.
9. 3D Comb panel (US version only).

4.2 Service Positions and Panel Removal

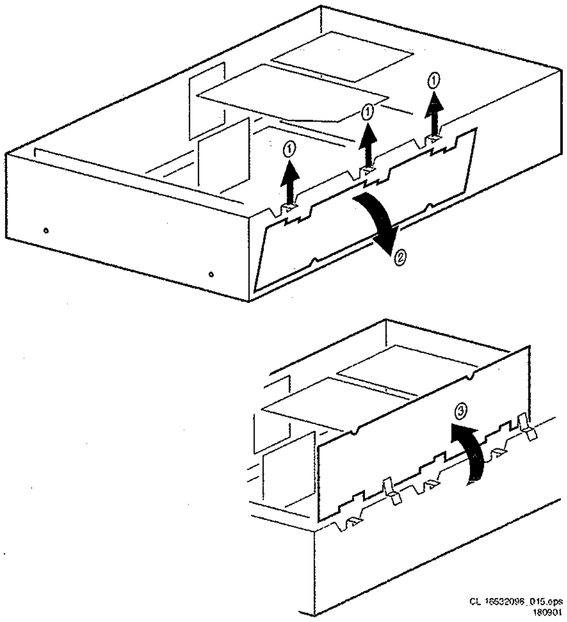
4.2.1 Front I/O Panel



CL 16532098_013.eps
140901

Figure 4-3 Front cover removal

Remove the front cover plate:
1. Pull tabs [A] slightly away from the top, bottom, and both sides of the receiver box.
2. Pull the front panel in the direction of the big arrow.



CL 16532098_015.eps
180901

Figure 4-4 Service position Front I/O panel

Remove the front I/O panel:
1. Lift the clamps [1] to release the Front I/O panel.
2. Unlock the Front I/O panel from the receiver box [2].
3. Park the front I/O panel on top of the housing [3]. Use a protection sheet to prevent short-circuiting.

Note: Be sure to keep track of the three copper grounding clips; they can be lost very easily, or they could cause a short circuit if they fall into the receiver box.

4.2.2 Power Supply Panel

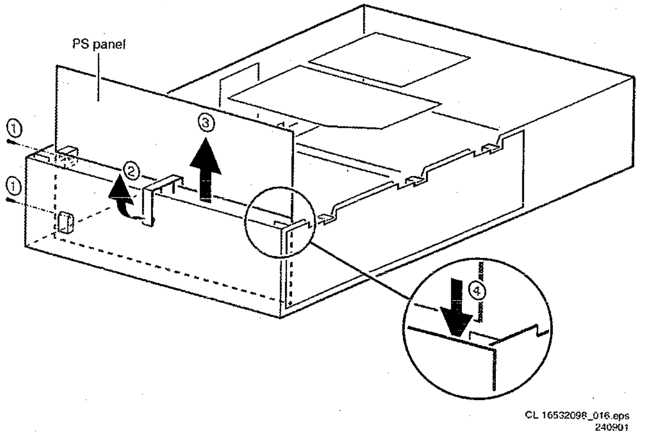


Figure 4-5 Service position Power Supply (PS)

1. Remove the front panel, if it was not yet removed.
2. Remove the two screws [1].
3. Remove the fixation bracket [2].
4. Pull the Power Supply panel out of the receiver box [3].
5. Place the Power Supply panel in the small slots on the edges of the top of the housing [4].

Warning: Be aware of the live voltages on this board during operation!

4.2.3 Double Window Panel (if present)

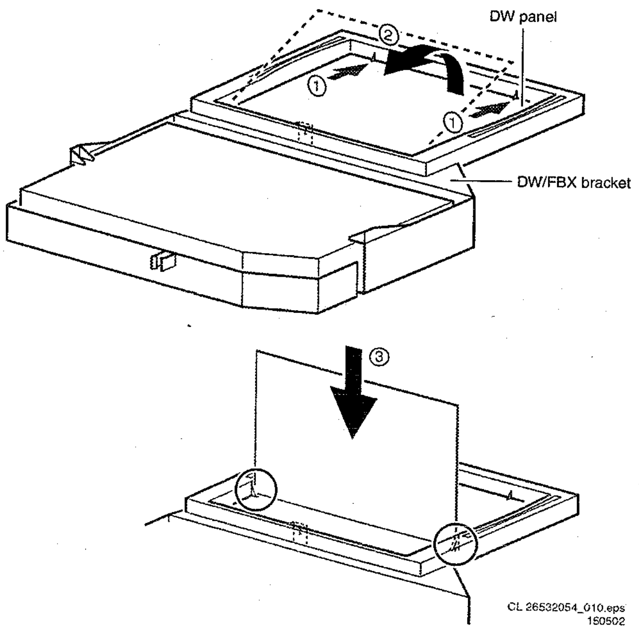


Figure 4-6 Service position Double Window panel

When the metal top cover is removed, the Double Window panel is accessible.
For the service position:

1. Release the clamps [1] and push the panel gently up and out of its bracket [2].
2. One of the cables must be temporarily disconnected to place the Double Window panel in its service position as shown in the figure.
3. Lead the removed cable in a favourable position and connect this cable again.

4.2.4 Feature Box module

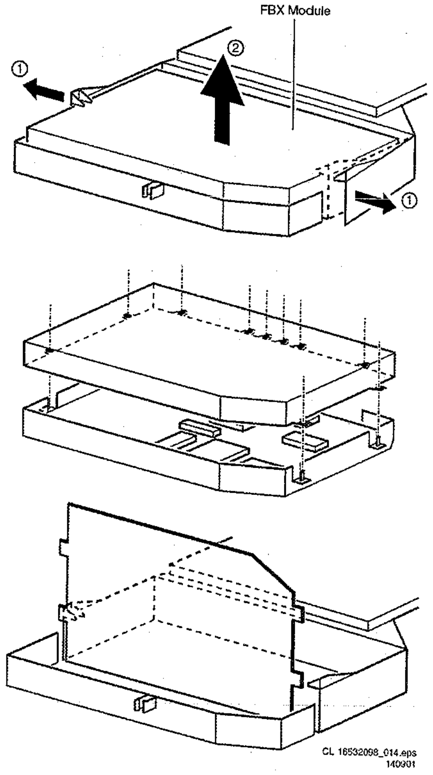


Figure 4-7 Service position Feature Box panel (FBX)

1. Pull the clamps aside [1], and lift the Feature box module [2].
2. Disconnect the necessary cables and remove the module.
3. Remove the shielding of the module: de-solder the fixation lugs.
4. Remove the Feature Box panel from the module.
5. Connect the cables and place the Feature Box panel in service position in the regarding bracket.

4.2.5 Small Signal Panel

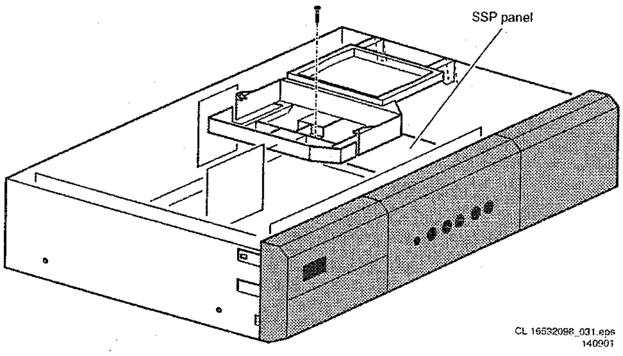


Figure 4-8 Removal of the Feature Box bracket

1. Release the clamps that secure the feature box module.
2. Lift the feature box module, disconnect the regarding cables and take out the module.
3. Release the side clamps that secure the Feature box bracket.
4. Remove the screw in the middle of the feature box position and remove the complete bracket.

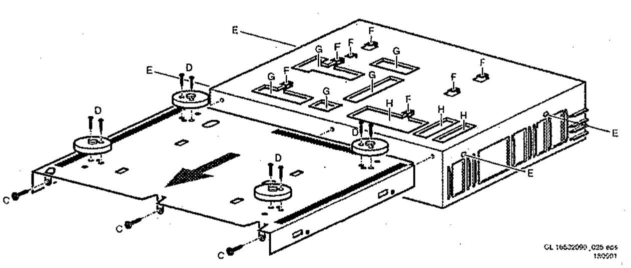


Figure 4-9 Removal of the bottom cover plate

To access the **copper side** of the Small Signal Panel, it is necessary to remove the metal bottom cover:

1. Turn the TV receiver box upside down.
2. Remove the three screws [C] that secure the bottom plate at rear side.
3. Remove the screws [D] that hold the four feet and remove the feet.
4. Pull the metal bottom cover backwards (lift it over the studs [E]). Be aware of the hooks [F] on the frame.

Remove the Small Signal Panel:

1. Disconnect all cables.
2. Remove at rear side of the receiver box the three mounting screws that secure this panel to the back plate.
3. Release the clamps that secure the Small Signal Panel and carefully take it out.

4.2.6 Audio Video Interface panel

If the metal bottom cover is removed, the copper side of the AVI panel is accessible.

Remove the Audio Video Interface panel

1. Make sure that the Feature Box module and its bracket is removed as described above.
2. Disconnect all cables.
3. Remove at rear side of the TV receiver box the three mounting screws that secure this panel to the backside.
4. Remove the four distance stud screws belonging to the PC/MAC IN and MONITOR OUT sockets.
5. Release the clamps that secure the Audio video interface and carefully take out the Small Signal Panel.

4.2.7 Down Scaler Panel (if present)

1. This Down Scaler panel stands normally in an upright service position.
2. To remove this panel: pull it firmly out of its connectors, mounted on the Audio Video Interface.

Note: Be sure to keep track of the two copper grounding clips; they can be lost very easily, or they can cause short circuiting when falling into the receiver box.

4.2.8 HD/SD (High/Standard Definition) Panel

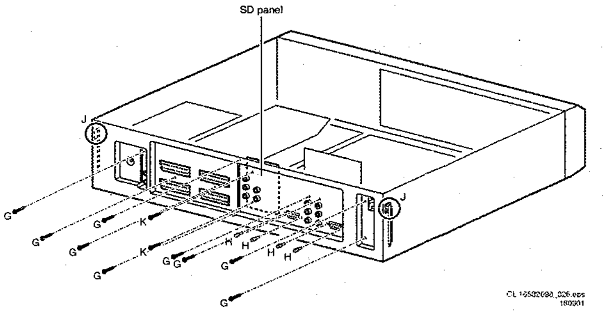


Figure 4-10 Removal of the HD/SD panel)

There is no service position defined for this panel. The best way to perform measurements on this panel is to remove the Feature Box bracket as described above. Then the component side of this single sided panel is accessible.

To remove the HD/SD panel:
Unscrew the screws that hold the panel (on the inside of the TV receiver).

4.2.9 3D Comb panel (US only)

1. Remove both mounting screws
2. Turn it in a favourable position and lift it (if necessary release and lift the Feature Box bracket a fraction at right side).
3. Release the cable from the special shaped cable clamp.

Note: Use a protection sheet to prevent short-circuiting if you place the unit in service position.

1. If necessary, you can remove the panel from its bracket. To do this, release the clamps that secure the panel in the bracket and remove the panel out of the bracket.

4.3 Reassembly

- To re-assemble the TV receiver, perform the disassembly processes in reversed order.
- Before re-placing the top cover, verify the correct connections for all the cables, and lead the cables in the original positions

5. Service Modes, Error Codes, and Fault Finding

Index of this section:

1. Test Points
2. Service Modes
3. Problems and Problem Solving Tips (related to CSM).
4. ComPair
5. Error Codes
6. Protections
7. Repair Tips

5.1 Test Points

5.1.1 General

Perform measurements under the following conditions:

- Set in Service Default Mode.
- Video: Colour bar signal, received via the internal tuner.
- Audio: 3 kHz left, 1 kHz right.

Exceptions (when using external sources):

- Set in Service Default Mode (SDM).
- Video: If using a DVD player, use a "live" picture. If using a VGA source, use a picture of your choosing.
- Audio: You can use a service generator, or the audio from the DVD player or VGA source.

5.1.2 Waveforms

The chassis is equipped with test points printed on the circuit board assemblies. Test points are displayed in two different ways:

- The old method, still in use for re-used circuits (like the Small Signal Panel, the Double Window Panel, and the Feature Box), refers to the functional blocks. The test points have names starting with I for IF, S for sound, etc. The numbering is in a logical sequence for diagnostics.
- The new method, used for new circuits, uses service test points that are recognizable as tagged Fxxx points. With this method, factory test points are published (F-points are functional test points, I-points are test points for in-circuit testers in the factory. All these test points are on the copper side. When the test point is a service test point, it is tagged for recognition.

Not all test points have been measured, but they can serve as identification names in Service communication (for example, ComPair fault find trees, Force32 files).
In the following cases, there will also be no waveform:

- When a V_dc voltage is displayed in the diagrams, or when the waveform does not have an additional value.
- When the sources are not easy accessible for the Service engineer (for example, HD source, VGA source).
- External AV inputs are not measured, since the waveform is equal to the source (dependent of load resistor matching).

5.1.3 DC voltages

The DC voltages are measured at practically all semiconductor pins. These values are displayed in the circuit diagrams. If a DC value is displayed between brackets then this value is measured in "standby" mode.
Note: DC voltages are also measured on the connectors.

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) offer several features for the service technician, while the Customer Service Mode (CSM) is used for communication between the servicer and the customer.
There is also the option of using ComPair, a hardware interface between a computer (see requirements) and the FTV chassis. It offers the ability of structured troubleshooting, a test pattern generation, error code reading, software version readout, and software upgrading. (Software upgrading is not available for all chassis)
Minimum requirements for ComPair: a Pentium Processor, Windows 9x/NT/2000/XP/ME, and a CD-ROM drive (see "ComPair" section).

5.2.1 Service Default Mode (SDM)

Purpose

- To create a pre-defined setting to get the same measurement results as given in this manual.
- To override SW protections (only when SDM is entered via the "service pins" on SSP connector 0356).
- To start the "blinking LED" procedure.

Specifications

- Tuning frequency: 475.25 MHz for PAL/SECAM sets.
- Colour system: PAL B/G.
- All picture settings at 50 % (brightness, colour, contrast).
- Bass, treble and balance at 50 %; volume at 25 %.
- All service-unfriendly modes (if present) are disabled. The service unfriendly modes include:
  - Sleep timer.
  - Smart modes.
  - On Timer.
  - Child lock.
  - Black mute.

How to enter SDM
To enter SDM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: **062596** directly followed by **MENU**.
- Short pins 2 and 3 of connector 0356 on the SSP (the two pins nearest to the rear panel) while the set is in the normal operation mode.

Caution: Entering SDM by this method will override all processor-controlled protections. When doing this, the service technician must know exactly what he is doing, as this could damage the set.

- Use the "Dealer Service Tool (DST) emulation feature" of ComPair.

After entering SDM, a blank screen is visible, with "Service Default" in the upper part for recognition. The "blinking LED" procedure is started and will indicate any possible errors via the front LED.

How to navigate in SDM
To toggle to the SAM mode, press the following key sequence on the remote control transmitter: **062596** directly followed by **OSD (i+)**.

How to exit SDM
Switch the set to STANDBY by pressing the POWER button on the remote control transmitter (if you switch the set OFF by disconnecting the AC power cable, the set will remain in SDM when AC power is reapplied).

5.2.2 Service Alignment Mode (SAM)

Purpose

- To perform (software) alignments.
- To change the option settings.
- Easy identification of the software version.
- To view operational hours.
- To display (or clear) the error code buffer.
- To give the service technician the possibility (through a special sequence of navigating and selecting) to diagnose E-box problems in combination with a standard PC monitor.

Specifications

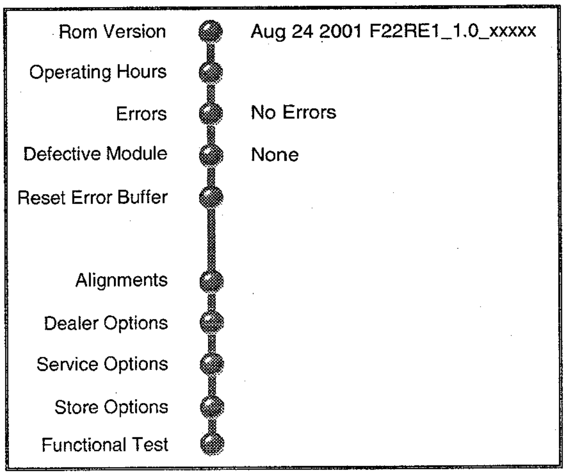
- Software version of main processor.
- Operational hours counter.
- Dealer options.
- Service options.
- Error buffer reading and erasing.
- Alignments.
- Functional test.

How to enter SAM

Use one of the following methods:

- Press the following key sequence on the remote control transmitter: **062596** directly followed by **OSD (i+)**.
- Short jumpers 1 and 2 of connector 0356 on the SSP (the two pins nearest to the front panel) while the set is in the normal operation mode..
- Use the "Align" key of the Dealer Service Tool (DST) emulation feature of ComPair.

After entering SAM, the following screen is visible:



Rom Version Aug 24 2001 F22RE1_1.0_xxxxx
Operating Hours
Errors No Errors
Defective Module None
Reset Error Buffer
Alignments
Dealer Options
Service Options
Store Options
Functional Test

CL 36532030_015.eps
170403

Figure 5-1 SAM screen shot

- **OPERATION HOURS.** The accumulated total of operation hours of the Receiver box. Every time the Receiver box is switched "on", 0.5 hour is added to the operation hours counter.
- **HARDWARE INFO.** Indicates the software date and version (MMMDDYYYY AAAABC_X.Y_xxxxx) of the box.
  - MMMDDYYY = software date
  - AAAA = the chassis name.
  - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM or G= Global).
  - C = the language cluster (1= English).
  - X = the main software version number.
  - Y = the sub software version number.
  - xxxxx = the last five digits of the 12nc code.
- **ERRORS.** Room for a maximum of 10 errors. The most recent error is displayed at the upper left position. For an explanation of the errors, see the error code table in the "Error Codes" section.
- **DEFECTIVE MODULE.** The module that generates an error is displayed here. If there are multiple errors in the buffer that have not all been generated by a single module, there is probably another defect. In that situation, the message "Unknown" will then be displayed here. If there are no errors, "None" is displayed.
- **RESET ERROR BUFFER.** Erases the contents of the error buffer. Press "OK" on the remote control transmitter to do this; the error buffer is cleared.
- **ALIGNMENTS.** Navigation by sub menus to service alignment items. The details of these alignments are explained in the "Electrical Alignments" section.
- **DEALER OPTIONS.** Controls the demonstration modes used by dealers for display purposes.
- **SERVICE OPTIONS.** In this sub menu, the options can be set. The quickest method to do this is through HW option number entry.
- **INITIALISE NVM.** When an NVM was corrupted (or replaced) in the MG3.1E chassis, the microprocessor replaced the content with default data (to assure that the set could operate). However, all presets and alignment values were gone now, and option numbers were also not correct. Therefore, this was a very drastic way. In this chassis, the procedure is implemented in another way: The moment the processor recognises a corrupted NVM, an extra line will be added to the SAM menu: **'INITIALISE NVM'.** Now, you can do two things (dependent of the service instructions at that moment):
  - Save the content of the NVM via ComPair for development analysis, **before** initialising. This will give the Philips Service department an extra possibility for diagnosis (e.g. when Development asks for this).
  - Initialise the NVM (same as in the past, however now it happens conscious).
- **STORE OPTIONS.** Service options must be stored here. **Note:** Without storing, no changes made to the options will be recorded. The servicer must remember to store all changes before exiting SAM for those changes to take effect.
- **FUNCTIONAL TEST.** Activate this test by pressing the "OK" key on the remote control transmitter. Eventual errors are displayed in the error buffer. The error buffer is **not** erased, although it looks that way. By exiting SAM and then entering SAM again, you will see the error buffer still contains the previous contents.
- **SW MAINTENANCE.** This menu item contains software "event logging" information, which can be delivered to the Philips Development Centre on special request.

How to navigate in SAM

Use one of the following methods:

- In SAM, select menu items with the "Cursor Up/Down" keys on the remote control transmitter. The selected "ball" item is highlighted and becomes a "puck" (blue becomes yellow). When not all menu items fit on the screen, this is shown by two "ball" figures overlapping. Use the " Cursor Up/Down " keys to display the next / previous menu item(s).
- With the "Cursor Left/Right" keys, it is possible to:
  - (De)activate the selected menu item.
  - Change the parameter of the selected menu item (some times through a "slider" entry)
  - Activate the selected submenu.
- To toggle to the SDM mode, press the following key sequence on the remote control transmitter: 062596 directly followed by MENU.

Note: SAM is exited when the MENU button on the remote control transmitter is pressed once. If SAM is exited accidentally, you have to enter the SAM mode again to perform SAM alignments and adjustments.

How to exit SAM

To exit SAM, press the MENU button on the remote control transmitter once.

5.2.3 Customer Service Mode (CSM)

Purpose

The Customer Service Mode shows error codes and information on the Flat TV operation settings. The servicer can instruct the customer to enter CSM by telephone and read off the information displayed. This helps the servicer to diagnose problems and failures in the Flat TV set before making a service call.
The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to enter CSM

To enter CSM, use **one** of the following methods:

- Press the MUTE button on the remote control transmitter and the MENU button on the local keyboard simultaneously for at least four seconds.
- An alternative CSM entry method is to press the following key sequence on the remote control transmitter: **123654.** Do not allow the display to time out between entries while keying the sequence. The disadvantage of this method is that the selected source is changed, due to the key sequence. Therefore, the first method is preferred.

Upon entering the Customer Service Mode, the following screen will appear:

Customer Service Menu 1

- **SET TYPE.** This allows the customer to view the type number of the Receiver box, without looking at the bottom of this box (e.g. FTR9965/17S). This information can be very helpful when talking with the service technician.
- **SW VERSION.** Indicates the software version (AAAABC_X.Y_xxxxx) of the box.
  - AAAA = the chassis name.
  - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM or G= Global).
  - C = the language cluster (1= English).
  - X = the main software version number.
  - Y = the sub software version number.
  - xxxxx = the last five digits of the 12nc code.
- **FEATUREBOX.** Gives the 12nc of the used Feature Box software.
- **CODE 1.** Gives the last five errors of the error buffer. As soon as the built-in diagnosis software has detected an error, the buffer is adapted. If there are no errors, the text "0" is displayed.
- **CODE 2.** Gives the first five errors of the error buffer. As soon as the built-in diagnosis software has detected an error, the buffer is adapted. The most recent error is displayed on the leftmost position of the Code 2 line. Each error code is displayed as a 3-digit number. When less than 10 errors occur, the rest of the line(s) is (are) empty. If there are no errors, the text "0" is displayed. See the "Error Codes" section for a description of the error codes.
  Service Tip: When a group of adjacent errors has a specific colour, this means they have occurred in the same time window. This gives service technicians additional information.
- **VOLUME.** Shows the last status of the volume, as set by the customer. The parameter can vary from 0 (minimum) to 100 (maximum). Volume parameters can be changed by using the volume key on the remote control transmitter.
  Note: For "speaker less" TV monitors, this item is not shown.
- **BRIGHTNESS.** Gives the last status of the brightness, as set by the customer. The parameter can vary from 0 (minimum) to 100 (maximum). The brightness parameter can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "picture" and setting "brightness".
- **CONTRAST.** Gives the last status of the contrast, as set by the customer. The parameter can vary from 0 (minimum) to 100 (maximum). Contrast parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "picture" and setting "contrast".
- **COLOUR.** Gives the last status of the colour saturation, as set by the customer. The parameter can vary from 0 (minimum) to 100 (maximum). Colour parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "picture" and setting "colour".
- **HUE.** Gives the last status of the colour saturation, as set by the customer. The parameter can vary from -50 (minimum) to 50 (maximum). Hue parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "picture" and setting "hue".

You can select the next Customer Service Mode screen(s) by pressing the CURSOR DOWN key on the remote control transmitter. To return to the previous Customer Service Mode screen(s), press the CURSOR UP key on the remote control transmitter (there are four CSM menu screens).

Customer Service Mode Screen 2

- **SHARPNESS.** Gives the sharpness parameter, as set by the user. It can vary from 0 (minimum) to 7 (maximum). A noisy picture may result if there is a bad antenna signal, or the parameter of sharpness is set too high. Sharpness parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "picture" and setting "sharpness".
- **HEADPHONE VOLUME.** Gives the last status of the headphone volume, as set by the customer. The parameter can vary from 0 (minimum) to 100 (maximum). Headphone volume parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "sound" and setting "headphone volume".
- **CENTRE MODE.** Indicates the loudspeaker configuration of the monitor. If it is set to "On", then the internal speakers both produce centre sound (from the "centre input" input jack on the back of the set). If it is set to "Off", the speakers produce left and right sound. This parameter can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "Settings", "General" and choosing "Centre mode" = "On".
  Note: For "speaker less" TV monitors, this item is not shown.
- **SOUND MODE.** Indicates the selected sound mode, as selected by the customer. This can be "Stereo", or "Mono". This parameter can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "Settings", "General" and choosing "Sound mode".
- **TUNER FREQUENCY.** Gives the frequency of the main Tuner in MHz.
- **SURROUND MODE.** Indicates the by the customer selected surround mode (or automatically chosen mode). In case the set is a Non-Dolby set, there will be displayed '0'. If it is a Dolby-set then is displayed: 'Stereo', 3D Surround', 'Dolby Pro Logic', 'Dolby 3 Stereo', or 'Hall'. These settings can be influenced by toggling the surround mode button on remote control (white button). It can also have been selected automatically by signalling bits (internal software).
  Note: For "speaker less" TV monitors, this item is not shown.

- **DIGITAL OPTION.** This can be:
  - Progressive Scan
  - Movie Plus
  - Pixel Plus
- **TV SYSTEM.** Gives information about the video system of the selected transmitter.
  - BG: PAL BG signal received
  - DK: PAL DK signal received
  - I: PAL I signal received
  - L/La: SECAM L/L' signals received
  - M38.9: NTSC M signal received with video carrier on 38.9 MHz
  - MN: NTSC M signal received
- **BALANCE.** Gives the last status of the balance, as set by the customer. The parameter can vary from -50 (maximum left balance) to 50 (maximum right balance). Balance parameters can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "sound" and setting "balance".
- **DNR.** This is the setting of Dynamic Noise Reduction. This can be set to "Off", "minimum", "medium", or "maximum".

Customer Service Mode Screen 3

- **NOISE FIGURE.** Gives the selected noise ratio for the selected transmitter. This parameter can vary from 0 (good signal) to 255 (bad signal).
  Note: This measured value only has significance when the "active control" mode is activated (this can be done by pressing the "active control" key on your remote control transmitter).
- **SOURCE.** This source parameter can be changed by using the CURSOR LEFT and CURSOR RIGHT keys on the remote control transmitter after pressing the "menu" button and navigating to "Menu", "Setup", and choosing "Source". The "quality" parameter depends how you connect your source: for example, if you connected the source to the Video input or to the SVHS input. This can be set to
  - Tuner (default)
  - EXT1.
  - EXT2.
  - EXT3.
  - EXT4.
  - EXT5.
  - Front.
  - VGA. Behind this source value there is an item referring to the "quality" of the chosen source:
    - Tuner (default)
    - VIDEO/STEREO.
    - VIDEO/NICAM.
    - S-VIDEO/STEREO.
    - S-VIDEO/NICAM.
    - RGB/STEREO.
    - YUV/STEREO.
    - YPBPR 1FH/STEREO.
    - YPBPR 2FH/STEREO.
- **AUDIO SYSTEM.** Gives information about the audio system of the selected transmitter.
  - Analog Mono.
  - Analog Stereo.
  - PCM 2/0.
  - DD: 1/0, 2/0 LtRt, 2/0 L0R0, 2/1, 2/2, 3/0, 3/1, 3/2, or 1+1.
  - MPEG: 1/0, 2/0, 2/0 LtRt, 2/1, 2/2, 3/0, 3/1, 3/2, 1+1, or 2+2.
- **TUNED BIT.** Gives information about the tuning method of the stored preset.
  - If a channel is detected by searching (manual as well as automatic installation), the micro-search tuning algorithm is used. When a channel is identified and stored, this will display YES.
  - When you install a preset (while the channel is not being broadcast) with "digit entry"/"fine tune", the display (after storing) will read NO. If the channel is found later (after a successful micro-search), the tuned bit will change to "Yes". If the tuned bit displays "No", something is wrong with the installed preset. Please reinstall the preset.
- **ON TIMER.** Gives information about the timer settings. This can be:
  - Off.
  - On.
  - Time (e.g. 18.25).
  - Day (e.g. Monday).
  - Program Number (e.g. PR23).
- **PRESET LOCK.** Gives the status info. This can be:
  - Unlock.
  - Locked.
- **CHILD LOCK.** Gives the status info. This can be:
  - Unlock.
  - Locked.
  - Custom.
- **AGE LOCK.** Gives the status info. This can be:
  - Off.
  - 4, 6, 8, 10, 12, 14, or 16 years.
- **Lock After.** Gives the status info. This can be:
  - Off.
  - Time (e.g. 18.45).
- **CATEGORY LOCK.** Gives the status info. This can be:
  - Off
  - Movies, News, Shows, Sports, Children, Music, or Culture.

Customer Service Mode 4

- **PROGRAM CATEGORY.** Gives the status info. This can be:
  - Off
  - Movies, News, Shows, Sports, Children, Music, or Culture.
- **SW CODE 1.** This code is only for Development. **Do not use it.**
- **SW CODE 2.** This code is only for Development. **Do not use it.**
- **OPTIONS 1.** Gives the Group 1 option code overview (see further for more details).
- **OPTIONS 2.** Gives the Group 1 option code overview (see further for more details).

5.3 Problems and Solving Tips (Related to CSM)

5.3.1 Picture Problems

Note: The problems described below are related to the TV settings (customer settings). The procedures to change the parameters (or status) of the different settings are described.

Snowy/noisy picture

Check the NOISE FIGURE line. If the value is 127 or higher and is also high on other programs, check the aerial cable/ aerial system.

Picture too dark

- Press the "Smart Picture" button on the remote control transmitter. If the picture improves, increase the brightness value or increase the contrast value. The new value(s) are automatically stored for all TV channels.
- If the picture improves after entering CSM, increase the brightness value or increase the contrast value. The new value(s) are automatically stored for all TV channels.
- Check the BRIGHTNESS and CONTRAST lines. If the value of BRIGHTNESS is low (<15) or the value of CONTRAST is low (<15), increase the brightness value or increase the contrast value.

Picture too bright

- Press the "Smart Picture" button on the remote control transmitter. If the picture improves, reduce the brightness

value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
- If the picture improves after entering CSM, reduce the brightness value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
- Check BRIGHTNESS and CONTRAST. If the value of BRIGHTNESS is high (>60) or the value of CONTRAST is high (>75), reduce the brightness value or increase the contrast value.

Fading picture
Digital scan effect. Check the DNR line. The status of DNR is a value between 0 and 100. There is no practical way to explain the significance of this value. If the picture is fading, adjustment of the DNR level may help. The DNR level can be adjusted by the following navigation route: "Menu" - "Picture" - "DNR". There are four different selectable levels.

White line around picture elements and text
- Press the "Smart Picture" button on the remote control transmitter. If the picture improves, reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
- If the picture improves after entering CSM, reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
- Check the SHARPNESS line. If the value is too high, reduce the sharpness value. The new value(s) are automatically stored for all TV channels.

Black picture and/or unstable picture
Improper signal is being received. Check the NOISE FIGURE line. If the value is higher then 127, the signal is suspect. Check your cable or aerial signal.

Black and white picture
Check the COLOUR line. If this value is low (<30), increase the "Colour" value. The new value(s) are automatically stored for all TV channels.

Menu text not sharp enough
- Press the "Smart Picture" button on the remote control transmitter. If the picture improves, reduce the contrast value. The new value(s) are automatically stored for all TV channels.
- If the picture improves after entering CSM, reduce the contrast value. The new value(s) are automatically stored for all TV channels.
- Check the CONTRAST line. If this value is high (>75), reduce the contrast value.

5.3.2 Sound problems (only with FTV-monitor connected)

No sound from left and right speaker.
Possible solutions:
- Press the "Smart Sound" button on the remote control transmitter. If the sound improves, raise the volume value. The new value(s) are automatically stored for all TV channels.
- If the volume is acceptable after entering CSM, increase the volume. The new value(s) are automatically stored for all TV channels.
- Check the VOLUME line. If the value is low, increase the "Volume" value. The new value(s) are automatically stored for all TV channels.

Sound too loud from left and right speaker.
- Press the "Smart Sound" button on the remote control transmitter. If the sound improves, reduce the volume value. The new value(s) are automatically stored for all TV channels.
- If the volume is acceptable after entering CSM, decrease the volume. The new value(s) are automatically stored for all TV channels.
- Check the VOLUME line. If the value is high, reduce the "Volume" value. The new value(s) are automatically stored for all TV channels.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development of the DST (special remote control transmitter for service), which allows faster and more accurate diagnostics. ComPair has three big advantages:
ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
ComPair allows very detailed diagnostics (on I2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C commands yourself because ComPair takes care of this.
ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force electronic manual of the chassis being serviced, schematics and CBAs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based faultfinding program and an interface box between PC and the product. The ComPair interface box is connected to the PC via a serial or RS232 cable.
With the F22R Receiver box, the ComPair interface box and the Receiver box communicate via a bi-directional infrared link.

The ComPair faultfinding program is able to detect and diagnose problems occurring in the product. ComPair can gather diagnostic information in two ways:
- **Automatic** (by communication with the Receiver box): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I2C level. ComPair can access the I2C bus of the Receiver box. ComPair can send and receive I2C commands to the microprocessor of the Receiver box. In this way, it is possible for ComPair to communicate (read and write) to devices on the I2C busses of the Receiver box.
- **Manually** (by asking questions to you): Automatic diagnosis is only possible if the microprocessor of the Receiver box is working correctly, and only to a certain extent. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions (for example, *Does the screen give a picture? Click on the correct answer: YES / NO*), and showing you examples (for example, *Measure test point I7 and click on the oscillogram you see on the oscilloscope*). The servicer can answer by clicking on a link (for example, text or a waveform picture) that will bring you to the next step in the faultfinding process.

By a combination of automatic diagnostics and an interactive question and answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Beside fault finding, ComPair provides some **additional features** like:
- Uploading or downloading of presets.
- Management of preset lists.
- Emulation of the Dealer Service Tool (DST).
- If both ComPair and the Force electronic service manual are installed, all the schematics and the CBAs of the

product are available by clicking on the appropriate hyperlink.
Example: *Measure the DC-voltage on capacitor C2568 (Schematic/Panel) at the SSP.*
- Click on the "Panel" hyperlink to automatically show the CBA with a highlighted capacitor C2568.
- Click on the "Schematic" hyperlink to automatically show the electronic position of the highlighted capacitor.

5.4.3 How to Connect ComPair

1. First, install the ComPair Browser software on your PC (read the installation instructions carefully).
2. Connect the RS232 interface cable between a free serial (COM) port of your PC and the PC connector (marked "PC") of the ComPair interface.
3. Connect the AC power adapter to the supply connector (marked "POWER 9V DC") on the ComPair interface.
4. Switch the ComPair interface OFF.
5. Switch the Receiver box OFF (and remove the AC power).
6. Point the ComPair interface to the Service send-LED (behind the cover) on the front of the Receiver box.
7. Plug the AC power adapter in an AC power outlet and switch on the ComPair interface. The green and red LEDs light up together. The red LED turns off after approximately 1 second, while the green LED remains lit.
8. Start the ComPair program and read the "introduction" chapter.

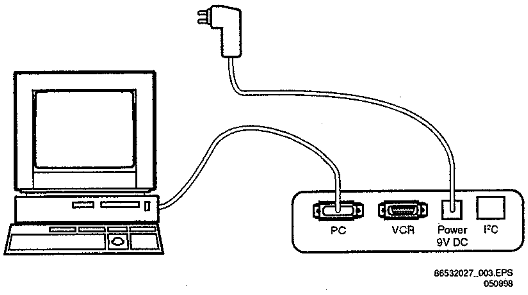


Figure 5-2 ComPair set-up

5.4.4 How to Order

ComPair order codes (EU/AP):
- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excluding transformer): 4822 727 21631.
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (update): 3122 785 60070.
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003). If you encounter any problems, contact your local support desk.
- ComPair interface cable: 3122 785 90004.

5.4.5 Stepwise Start-up / Shut-down

Under normal circumstances, a fault in the power supply, or an error during start-up, will switch the television to protection mode. ComPair can take over the initialisation of the television. In this way, it is possible to distinguish which part of the start-up routine (hence which circuitry) is causing the problem.

Stepwise start-up explanation
This is realised via ComPair and is very helpful when a **protection** is activated (see also paragraph "Protections").

Table 5-1 Stepwise Start-Up Table

State	Mode description	Display LEDs(*)	Enabled protections
0	- Low power standby - uP in Standby.	Red 'on'	None
1	- High power standby. - TV-set in standby.	RedFlash 1 time	None
2	- Supply 'on'. - Protections 5V2 and 8V6 activated.	Orange/ GreenFlash 2 times	67 and 68
3	- Sound ICs initialised. - Protections FBX and TUNER activated.	Orange/ GreenFlash 3 times	Plus 77 and 80
4	Not used in FTV		
5	- TV operates. - Unblanked picture.	Orange/ GreenFlash 5 times	

Stepwise shutdown explanation
In the stepwise shutdown mode, state 2 and 4 are skipped.

Table 5-2 Stepwise Shut-Down Table

State	Mode description	Display LEDs(*)	Disabled protections
5	- TV operates. - Unblanked picture.	Orange/ GreenFlash 5 times	-
4	- All protections are 'on'.	Orange/ GreenFlash 4 times	-
3	- Sound ICs initialised. - All protections 'off'.	Orange/ GreenFlash 3 times	-
1	- High power standby. - TV-set in standby.	Red 0.5 Hz-Flash 1 time	80, 77, 68, and 67
0	- Low power standby. - uP in Standby.	Red 'on'	-

Note (*): When the set is in stepwise mode and, due to stepping-up, a protection is activated; the set will really go into protection (blinking LED). The set will not leave the stepwise-mode however. By stepping down, the set can be activated again, until state X where the protection was activated. At state (X-1) diagnostic measurements can be performed.

5.5 Error Codes

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is written at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

It is possible to read out the error buffer in three ways:
- On the screen while in Service Alignment Mode (SAM). If there is a picture, this is the easiest way to read the error buffer. In the SAM main menu, the last 10 error codes, which have occurred, are displayed. The most recently detected error code is displayed on the left side. Examples:
  - 003 000 000 000 000: error code 3 is the last and only detected error.
  - 002 003 000 000 000: error code 3 was detected first and error code 2 is the last detected (newest) error.
- With the CODE 1 and CODE 2 lines in CSM.
- With ComPair.

5.5.2 How to Clear the Error Buffer

It is possible to clear the error buffer in two ways:

- By selecting the item "Reset Error Buffer" in the SAM main menu.
- By pressing the following key sequence on the remote control transmitter: **MUTE - 062599 - OK.**

Note: When the error buffer is full (10 codes), no new errors can be stored. The set monitors how long every error is stored in the error buffer. If a false error is in the buffer, it will be deleted after 50 hours. If an actual error is in the error buffer, it will be written to the buffer again after 50 hours. This is a safeguard to ensure that the history of the error codes is stored.

To help ensure that you are not reading false error codes, you may want to record the contents of the error buffer, reset the buffer, and see which error codes are generated again by the set.

5.5.3 Error Codes

If the set has non-intermittent faults, clear the error buffer before you begin the repair. This to ensure that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error code and not the actual cause of the problem (for example, a fault in the protection detection circuitry can lead to a protection).

Table 5-3 Error Code Overview

Error	Device	Description	Defective item	Diagram	Defective module indication
2	ST24E32 or M24C32	Non volatile memory	IC7008	K7	Control
3	SAA580x	OTC2.5 microprocessor/TXT	IC7003	K7	Control
5	UV1316	Tuner	U1102	K1	Tuner
10	TEA6415	I/O source select video	IC7208	K8	Source select
11	TEA6422	I/O source select audio	IC7777	K8	Source select
15	TDA9320	HIP I/O-video processing	IC7501	K1	Chroma IF IO
20	TDA9330	HOP video control/deflection processor	IC7300	K6	Video Controller
21	TDA9178 (if present)	LTP Peaking (TOPIC)	IC7402	K6	Video Controller
23	UPD64083 (if present)	3D Comb IC	IC7023	C0	3D Comb Filter
25	MSP34xxx	ITT sound processor	IC7751	K3	Audio Module
27	PCF8574	I/O Expander	IC7880	AV8	AV-Interface
30	TEA6415	Video Selection Switch	IC7710	AV7	AV-Interface
31	TEA6422	Audio Selection Switch	IC7810	AV8	AV-Interface
33	ACEX-EPLD	HD signal/sync processing	IC7360	AV3	AV Interface
35	UV1316 (if present)	FDS Tuner	U1102	M1	Video Dual Screen Panel
36	PCF8574 (if present)	FDS I/O Expander	IC7860	M2	Video Dual Screen Panel
37	SAB9079 (if present)	FDS Popov	IC7700	M4	Video Dual Screen Panel
38	TDA9320 (if present)	FDS HIP2	IC7501	M1	Video Dual Screen Panel
39	M24C04 (if present)	FDS NVM	IC7991	M1	Video Dual Screen Panel
41	TDA7309 (if present)	FDS Headphone	IC7620	M5	Video Dual Screen Panel
50	SAA4978	FBX Picnic	IC7611	L1	Feature Box
52	T8F24EF (if present)	FBX Eagle	IC7724	L2	Feature Box
53	SAA4992	FBX Falconic	IC7626	L3	Feature Box
65	Slow I2C bus blocked		See block diagram	Slow I2C Blocked	
66	Fast I2C bus blocked		See block diagram	Fast I2C Blocked	
67	Supply 5V	5V2	See block diagram	+5V Supply	
68	Supply 8V	8V6	See block diagram	+8V Supply	
77	Featurebox protection	FBX prot.			+3V FBX Supply
80	Tuner protection	Tuner prot.	U1102	K1	+8V Tuner Supply
81	UPD64083 (if present)	3D Comb prot.	IC7023	C0	3D Comb Filter

5.6 Protections

The microprocessor (OTC) of the Receiver box remains active during standby. This because power of the microprocessor (and the attached memory chip set) is coming from the 3V3 supply, which is derived from the 5V Standby circuitry. Therefore, in both "Power on" as in "Standby" mode, the microprocessor is connected to this power supply. The microprocessor controls the "Standby" line for switching "on" and "off" the main supply. In the standby mode, or in the protection mode, the "Standby" line will open the contacts of relay 1400 (diagram PS) via T7401, which results in switching "off" the AC power input to the main supply.

We can divide the chassis protections in two groups:

1. I2C protections: from I2C-busses (fast and slow) or I2C-IC errors (device errors).
2. OTC input protections.

5.6.1 I2C Protections

During normal operation, some registers of the I2C controlled ICs are refreshed every 200 milliseconds. During this sequence, the three I2C busses and the I2C ICs will also be checked.

Possible protections:

- **I2C bus protections.** This will take place if the SDA and SCL are short-circuited to ground or to each other.
- **I2C device protections.** This can occur when there is a malfunction in the communication with one specific device, or if the power supply of the device is missing.
- **FBX and/or Tuner circuitry protection.** If one of these circuits does not respond for more than 1 second (measured via I2C), the Receiver box goes into protection mode.

5.6.2 OTC Input Protections

If a protection is detected at an input of the OTC, all protection inputs of the OTC will be scanned every 200 milliseconds five times. If the protection on one of the inputs is still activated after 1 second, then the set will go into protection mode.

Possible protections:

- **8V6 and 5V2 protection.** The presence of the 8V6 and 5V2 is sensed by the OTC. If the 8V6 and/or 5V2 are/is not present, then an error code is stored in the error buffer.

5.7 Repair tips

5.7.1 How to Deal with a "TV configuration" Situation

It is not easy to access the CSM menu without the accompanying plasma monitor. Therefore, it is best to retrieve this information while you still have the complete configuration. Depending on the fault, the problem may be easily solved. However, if this is not the case, some of the data recorded could assist you in the repair.

5.7.2 How to Deal with a "Receiver Box Only" Situation

Without the accompanying plasma monitor, the Receiver box will go into "Standby" mode after a few seconds (this monitor detection is designed to prevent Philips Receiver boxes from being used with other brands of monitors).
This detection can be overridden in the following way (to use, for example, a PC monitor):

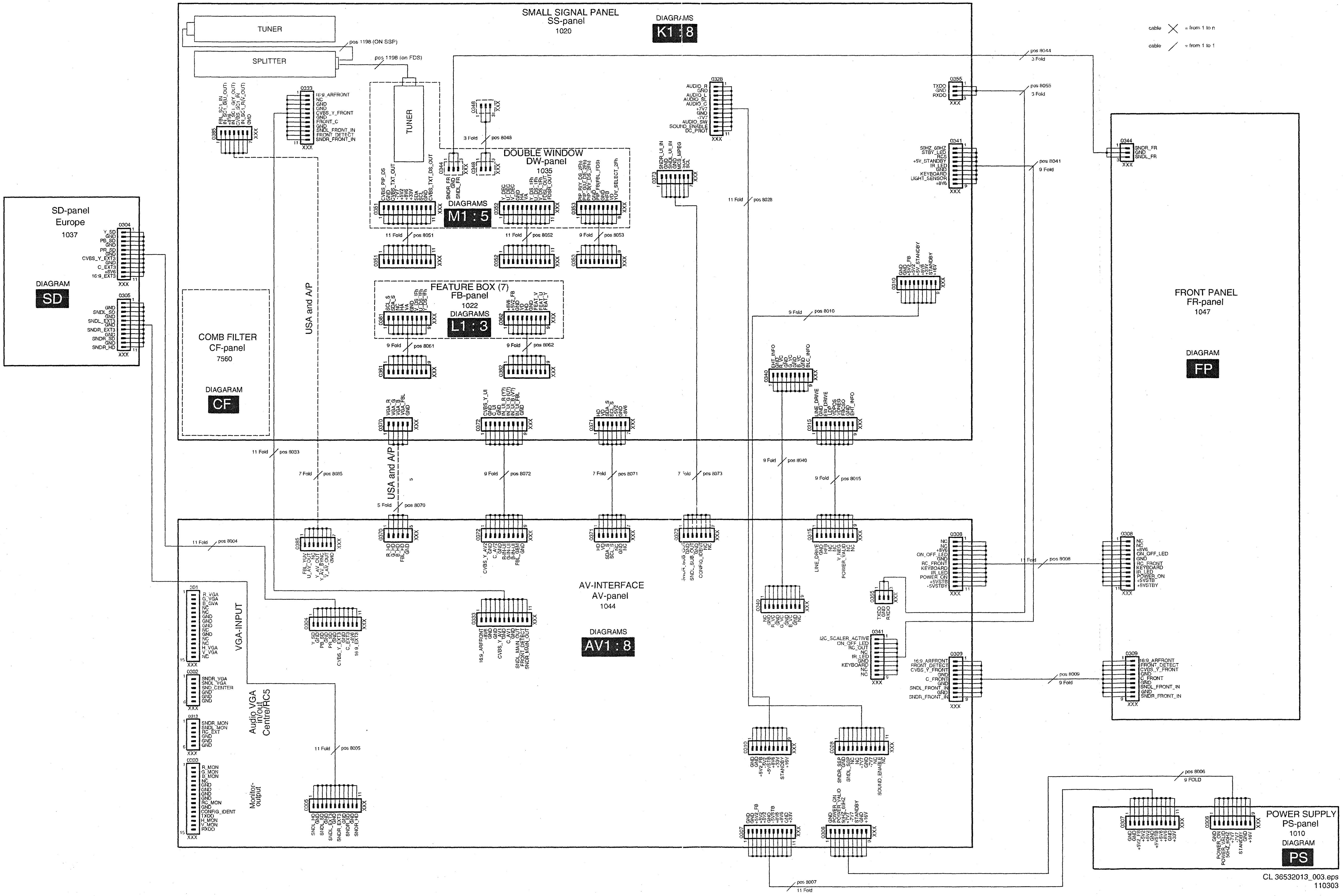
- Enter the SAM-mode via ComPair (using the "align" key of the DST simulation mode), or through the HW intervention of connector 0356 on the SSP (pins 2 and 3). The set will now operate in SDM. Then short pins 1 and 2 to enter SAM.
- Via navigation in the SAM menu and selecting, you must follow the this route: "Service Options" - "Miscellaneous" - "Stand-alone".
- Toggle "No" to "Yes" and store this change (this means that a bit is changed in the NVM).
- Now the Receiver box can operate with any monitor (for example, a PC monitor).
- The Service technician can now perform the diagnosis and repair (the CSM menu can also be accessed now).
- When the problem is solved, the Stand-alone option bit should be reset to "No", to return the set to the original setting.

5.7.3 Miscellaneous Tips/Remarks

- Sometimes, when there is an NVM related error/problem and the set does not want to start up, it can be helpful to start the set without the NVM (IC7008 on the IC holder on the SSP). You can see OSD on the monitor, for a short time, so you can conclude that much of the circuitry is working fine.
- If an empty EAROM (permanent memory) is detected, all settings are set to pre-programmed default (standard) values.
- To overrule the childlock PIN code, use code "0711".
- When the user settings related to optimal picture and sound performance are in doubt, one can restore the default factory settings via: "Settings" - "General" - "Reset AV settings", and pressing the "OK" key on the remote control transmitter. This may help correct an incorrect user setting faster, since the starting point is more clearly defined
(**for example,** the set will leave the factory with "DNR" on medium, "Dynamic Contrast" on medium, and "Sharpness" on 4, etc).

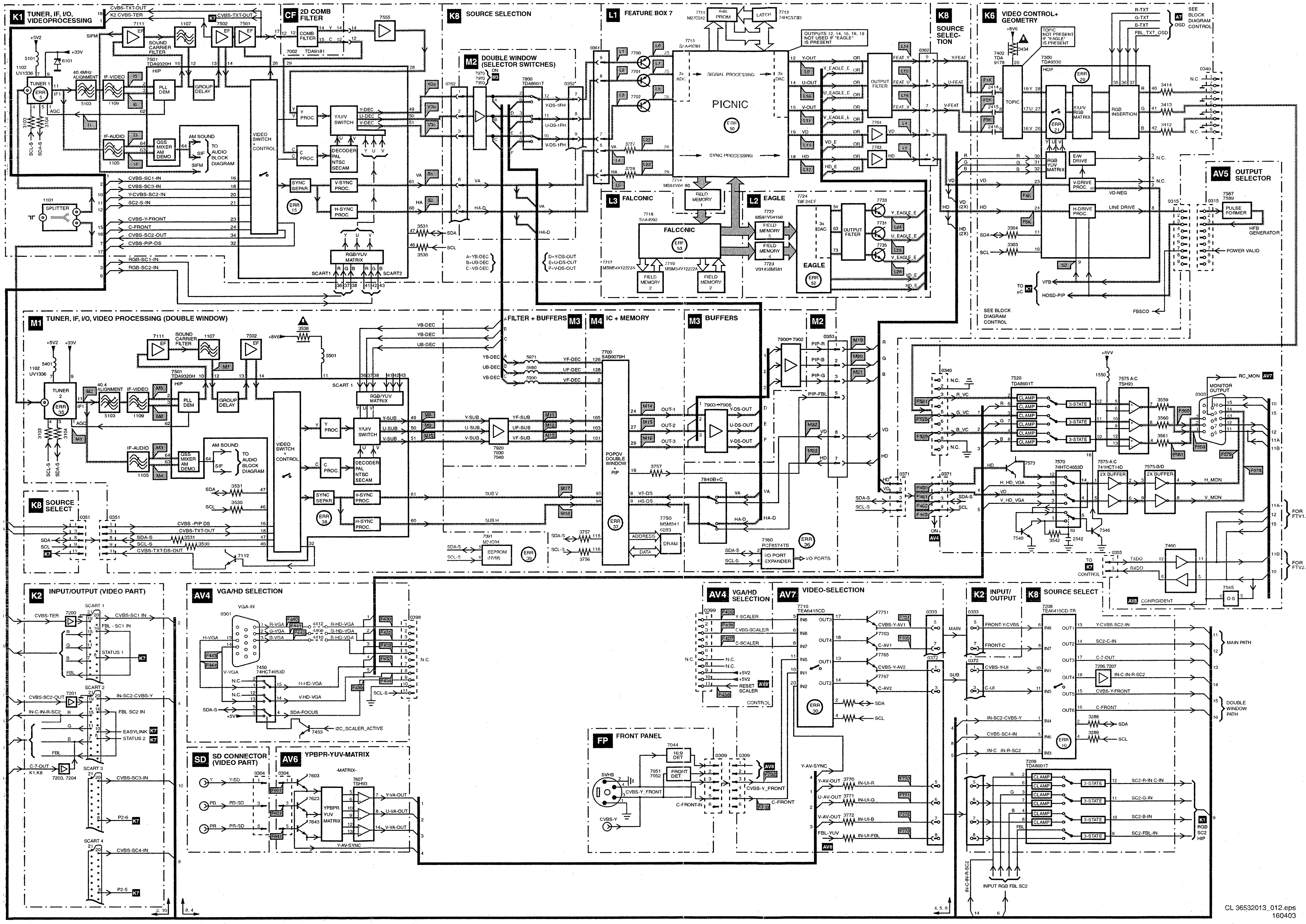
6. Block Diagrams, Testpoint Overviews and Waveforms

Wiring Diagram

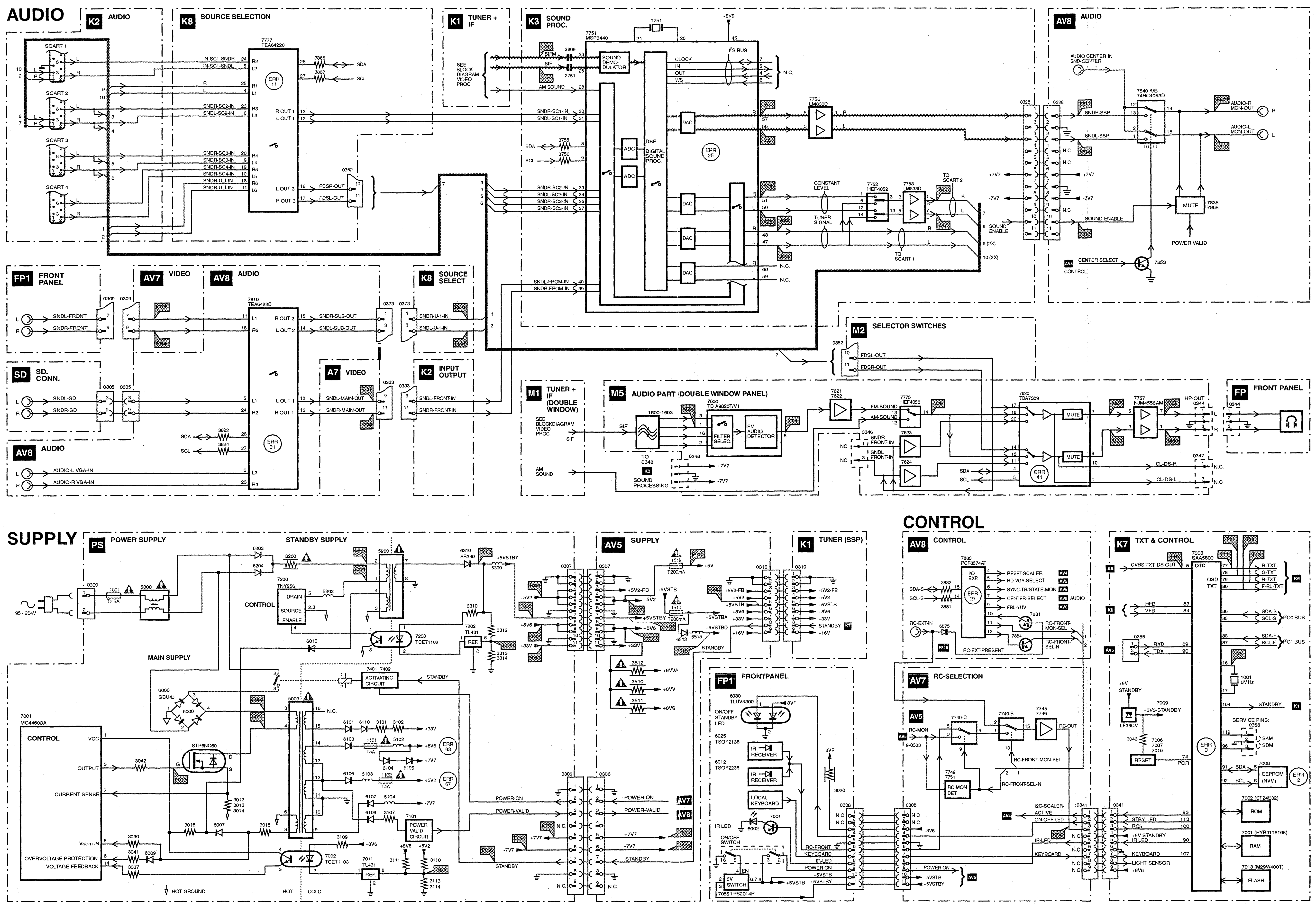

SMALL SIGNAL PANEL
SS-panel
1020
DIAGRAMS
K1 : 8
TUNER
SPLITTER
pos 1198 (ON SSP)
pos 1198 (on FDS)
TUNER
DOUBLE WINDOW
DW-panel
1035
DIAGRAMS
M1 : 5
FEATURE BOX (7)
FB-panel
1022
DIAGRAMS
L1 : 3
COMB FILTER
CF-panel
7560
DIAGARAM
CF
USA and A/P
SD-panel
Europe
1037
DIAGRAM
SD
FRONT PANEL
FR-panel
1047
DIAGRAM
FP
AV-INTERFACE
AV-panel
1044
DIAGRAMS
AV1 : 8
VGA-INPUT
Audio VGA in/out Centre/RC5
Monitor-output
POWER SUPPLY
PS-panel
1010
DIAGRAM
PS
cable = from 1 to n
cable = from 1 to 1

CL 36532013_003.eps
110303

Block Diagram (Video)

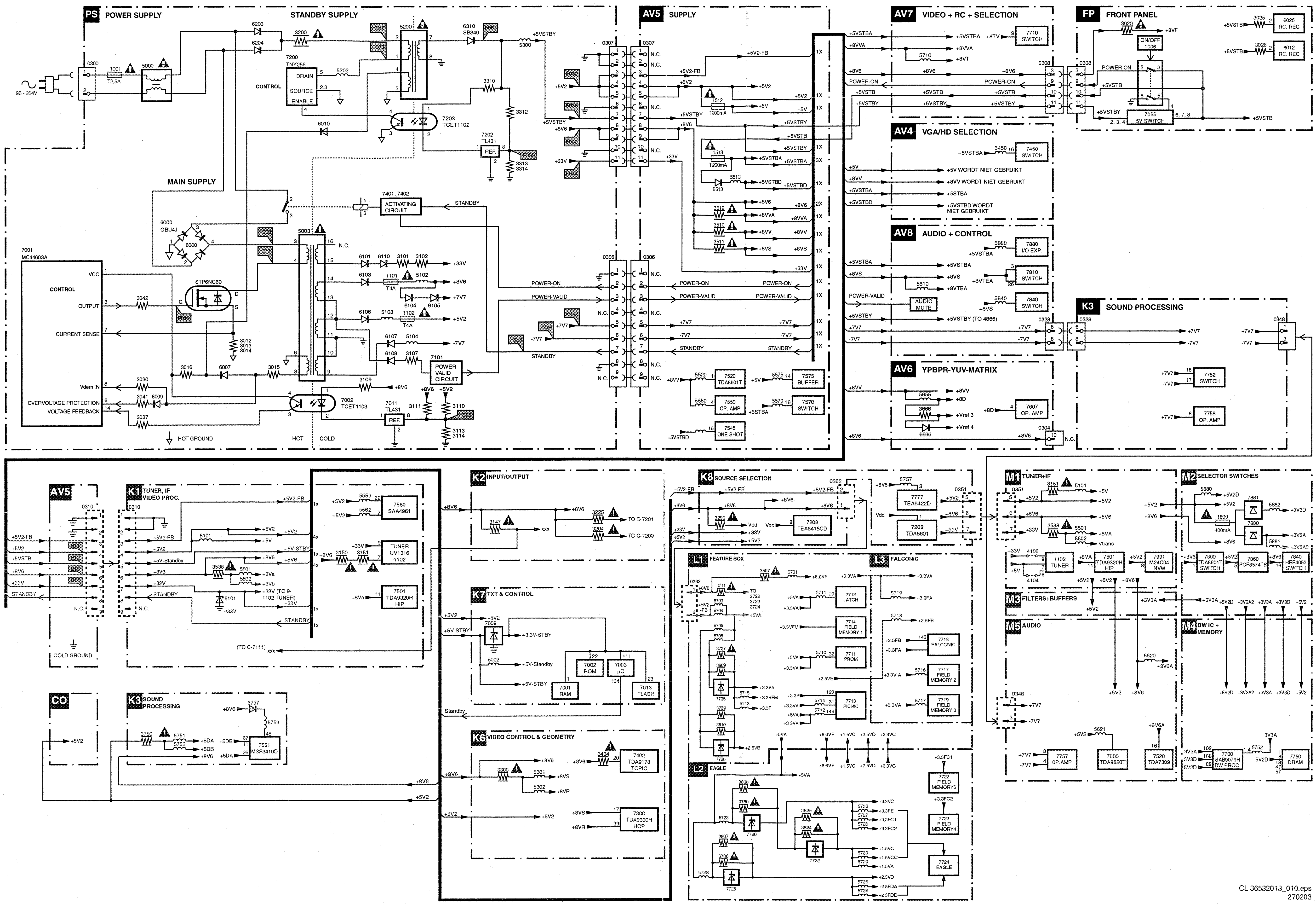

K1 TUNER, IF, I/O, VIDEOPROCESSING
CF 2D COMB FILTER
K8 SOURCE SELECTION
M2 DOUBLE WINDOW (SELECTOR SWITCHES)
L1 FEATURE BOX 7
PICNIC
L3 FALCONIC
L2 EAGLE
K8 SOURCE SELECTION
K6 VIDEO CONTROL+ GEOMETRY
AV5 OUTPUT SELECTOR
M1 TUNER, IF, I/O, VIDEO PROCESSING (DOUBLE WINDOW)
M3 FILTER + BUFFERS
M4 IC + MEMORY
M3 BUFFERS
M2
K8 SOURCE SELECT
K2 INPUT/OUTPUT (VIDEO PART)
AV4 VGA/HD SELECTION
SD SD CONNECTOR (VIDEO PART)
AV6 YPBPR-YUV-MATRIX
FP FRONT PANEL
AV4 VGA/HD SELECTION
AV7 VIDEO-SELECTION
K2 INPUT/ OUTPUT
K8 SOURCE SELECT
FOR FTV1.9
FOR FTV2.1
MAIN PATH
DOUBLE WINDOW PATH
INPUT RGB FBL SC2
CL 36532013_012.eps
160403

Block Diagram (Audio and Supply)


AUDIO
K2 AUDIO
SCART 1
SCART 2
SCART 3
SCART 4
K8 SOURCE SELECTION
7777 TEA6422D
K1 TUNER + IF
SEE BLOCK-DIAGRAM VIDEO PROC.
K3 SOUND PROC.
7751 MSP3440
SOUND DEMO-DULATOR
DSP DIGITAL SOUND PROC.
ADC
DAC
I²S BUS
CLOCK
IN
OUT
WS
7756 LM833D
7752 HEF4052
7758 LM833D
CONSTANT LEVEL
TUNER SIGNAL
TO SCART 2
TO SCART 1
SOUND ENABLE
AV8 AUDIO
AUDIO CENTER IN SND-CENTER
7840 A/B 74HC4053D
AUDIO-R MON-OUT
AUDIO-L MON-OUT
MUTE
7835 7865
POWER VALID
CENTER SELECT
7853
FP1 FRONT PANEL
AV7 VIDEO
AV8 AUDIO
7810 TEA6422D
K8 SOURCE SELECT
SD SD. CONN.
A7 VIDEO
K2 INPUT OUTPUT
AV8 AUDIO
M2 SELECTOR SWITCHES
FDSL-OUT
FDSR-OUT
M1 TUNER + IF (DOUBLE WINDOW)
M5 AUDIO PART (DOUBLE WINDOW PANEL)
7600 TD A9820T/V1
FILTER SELEC
FM AUDIO DETECTOR
SOUND PROCESSING
7775 HEF4053
7623
7624
7620 TDA7309
7757 NJM4556AM
HP-OUT
FP FRONT PANEL
SUPPLY
PS POWER SUPPLY
STANDBY SUPPLY
7200 TNY256
CONTROL
MAIN SUPPLY
95 - 264V
1001 T2.5A
5000
6000 GBU4J
STP6NC60
7001 MC44603A
CONTROL
VCC
OUTPUT
CURRENT SENSE
Vdem IN
OVERVOLTAGE PROTECTION
VOLTAGE FEEDBACK
7203 TCET1102
7202 TL431
7401, 7402 ACTIVATING CIRCUIT
5003
7101 POWER VALID CIRCUIT
7002 TCET1103
7011 TL431
HOT GROUND
HOT
COLD
+5VSTBY
+33V
+8V6
+7V7
+5V2
-7V7
STANDBY
POWER-ON
POWER-VALID
AV5 SUPPLY
+8VVA
+8VV
+8VS
K1 TUNER (SSP)
FP1 FRONTPANEL
6030 TLUV5300
ON/OFF STANDBY LED
6025 TSOP2136
6012 TSOP2236
IR RECEIVER
LOCAL KEYBOARD
IR LED
ON/OFF SWITCH
7055 TPS2014P
CONTROL
AV8 CONTROL
7880 PCF8574AT
I/O EXP
RESET-SCALER
HD-VGA-SELECT
SYNC-TRISTATE-MON
CENTER-SELECT
FBL-YUV
RC-FRONT-MON-SEL
RC-FRONT-SEL-N
RC-EXT-PRESENT
AV7 RC-SELECTION
7740-C
7740-B
7745 7746
RC-OUT
7749 7751 RC-MON DET
K7 TXT & CONTROL
7003 SAA5800
OTC
OSD TXT
R-TXT
G-TXT
B-TXT
F-BL-TXT
I²C0 BUS
I²C1 BUS
1001 6MHz
SERVICE PINS: 0356
SAM
SDM
7008 EEPROM (NVM)
7002 (ST24E32) ROM
7001 (HYB3118165) RAM
7013 (M29W400T) FLASH
RESET
POR
7009 +3V3-STANDBY
LF33CV

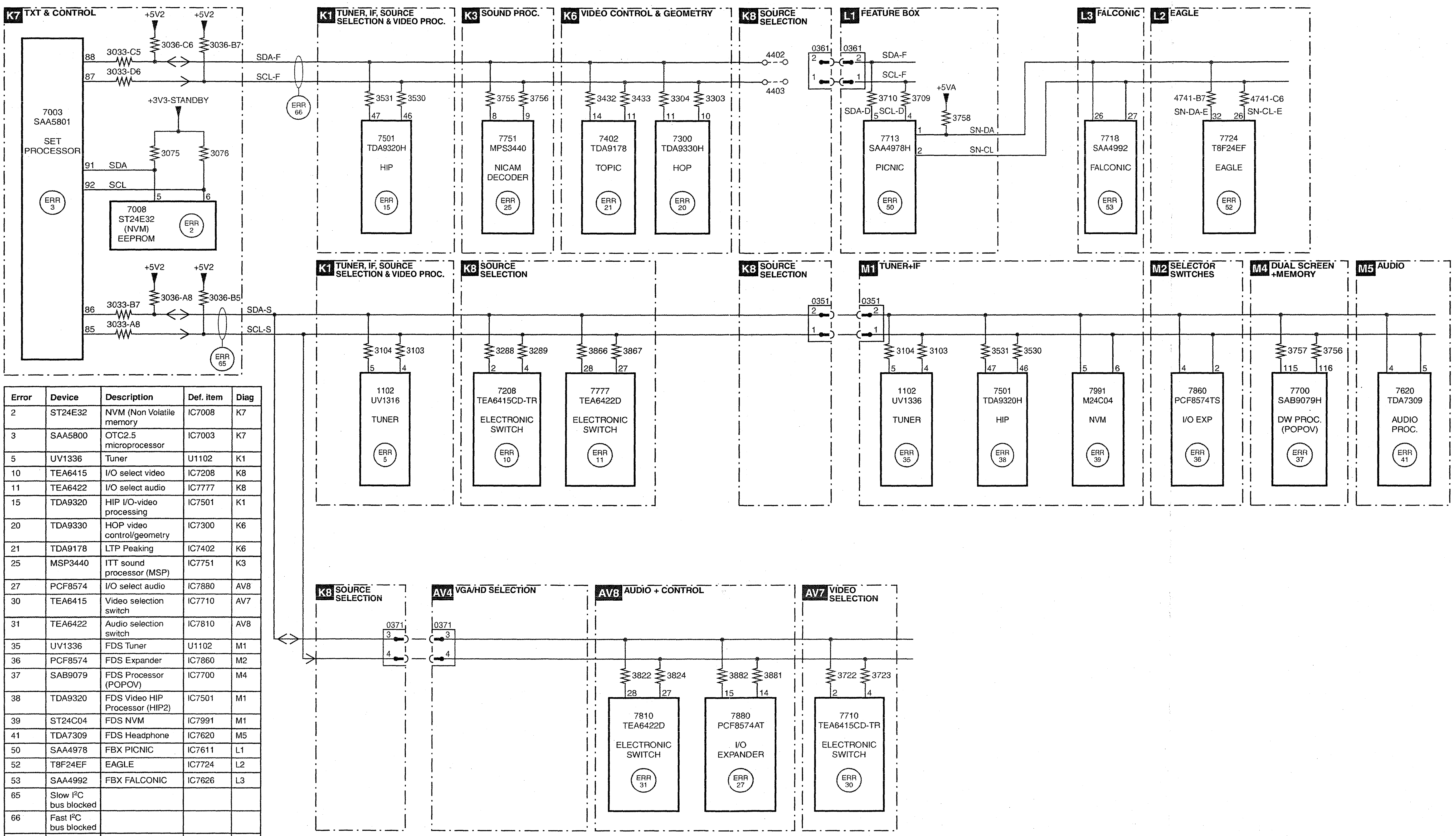
CL 16532023_001.eps
180403

Powerlines Overview


PS POWER SUPPLY
STANDBY SUPPLY
MAIN SUPPLY
CONTROL
7001 MC44603A
VCC
OUTPUT
CURRENT SENSE
Vdem IN
OVERVOLTAGE PROTECTION
VOLTAGE FEEDBACK
STP6NC60
6000 GBU4J
5003
7200 TNY256
DRAIN
SOURCE
ENABLE
7203 TCET1102
7202 TL431
REF.
7401, 7402 ACTIVATING CIRCUIT
7101 POWER VALID CIRCUIT
7002 TCET1103
7011 TL431
HOT GROUND
HOT
COLD
95 - 264V
1001 T2,5A
+5VSTBY
+33V
+8V6
+7V7
+5V2
-7V7
POWER-ON
POWER-VALID
STANDBY
AV5 SUPPLY
1512 T200mA
1513 T200mA
7520 TDA8601T
7575 BUFFER
7550 OP. AMP
7570 SWITCH
7545 ONE SHOT
AV7 VIDEO + RC + SELECTION
7710 SWITCH
FP FRONT PANEL
6025 RC. REC
6012 RC. REC
ON/OFF 1006
POWER ON
7055 5V SWITCH
AV4 VGA/HD SELECTION
7450 SWITCH
+5V WORDT NIET GEBRUIKT
+8VV WORDT NIET GEBRUIKT
+5VSTBD WORDT NIET GEBRUIKT
AV8 AUDIO + CONTROL
7880 I/O EXP.
7810 SWITCH
7840 SWITCH
AUDIO MUTE
K3 SOUND PROCESSING
7752 SWITCH
7758 OP. AMP
AV6 YPBPR-YUV-MATRIX
7607 OP. AMP
AV5
COLD GROUND
K1 TUNER, IF VIDEO PROC.
7560 SAA4961
TUNER UV1316 1102
7501 TDA9320H HIP
K2 INPUT/OUTPUT
TO C-7201
TO C-7200
K7 TXT & CONTROL
7009
7002 ROM
7003 µC
7001 RAM
7013 FLASH
K6 VIDEO CONTROL & GEOMETRY
7402 TDA9178 TOPIC
7300 TDA9330H HOP
CO
K3 SOUND PROCESSING
7551 MSP3410D
K8 SOURCE SELECTION
7208 TEA6415CD
7777 TEA6422D
7209 TDA8601
L1 FEATURE BOX
L3 FALCONIC
7712 LATCH
7714 FIELD MEMORY 1
7711 PROM
7718 FALCONIC
7717 FIELD MEMORY 2
7713 PICNIC
7719 FIELD MEMORY 3
L2 EAGLE
7722 FIELD MEMORY5
7723 FIELD MEMORY4
7724 EAGLE
M1 TUNER+IF
1102 TUNER
7501 TDA9320H HIP
7991 M24C04 NVM
M2 SELECTOR SWITCHES
7800 TDA8601T SWITCH
7860 PCF8574TS
7840 HEF4053 SWITCH
M3 FILTERS+BUFFERS
M5 AUDIO
M4 DW IC + MEMORY
7757 OP. AMP
7600 TDA9820T
7520 TDA7309
7700 SAB9079H DW PROC.
7750 DRAM

CL 36532013_010.eps
270203

I2C-IC's Overview


K7 TXT & CONTROL
+5V2
3036-C6
3036-B7
88
3033-C5
87
3033-D6
SDA-F
SCL-F
ERR 66
7003
SAA5801
SET PROCESSOR
ERR 3
+3V3-STANDBY
3075
3076
91 SDA
92 SCL
7008
ST24E32
(NVM)
EEPROM
ERR 2
3036-A8
3036-B5
86
3033-B7
85
3033-A8
SDA-S
SCL-S
ERR 65
K1 TUNER, IF, SOURCE SELECTION & VIDEO PROC.
3531
3530
7501
TDA9320H
HIP
ERR 15
K3 SOUND PROC.
3755
3756
7751
MPS3440
NICAM DECODER
ERR 25
K6 VIDEO CONTROL & GEOMETRY
3432
3433
3304
3303
7402
TDA9178
TOPIC
ERR 21
7300
TDA9330H
HOP
ERR 20
K8 SOURCE SELECTION
4402
4403
L1 FEATURE BOX
0361
SDA-F
SCL-F
+5VA
3710
3709
SDA-D
SCL-D
3758
7713
SAA4978H
PICNIC
ERR 50
SN-DA
SN-CL
L3 FALCONIC
7718
SAA4992
FALCONIC
ERR 53
L2 EAGLE
4741-B7
4741-C6
SN-DA-E
SN-CL-E
7724
T8F24EF
EAGLE
ERR 52
K1 TUNER, IF, SOURCE SELECTION & VIDEO PROC.
3104
3103
1102
UV1316
TUNER
ERR 5
K8 SOURCE SELECTION
3288
3289
7208
TEA6415CD-TR
ELECTRONIC SWITCH
ERR 10
3866
3867
7777
TEA6422D
ELECTRONIC SWITCH
ERR 11
K8 SOURCE SELECTION
0351
M1 TUNER+IF
0351
3104
3103
1102
UV1336
TUNER
ERR 35
3531
3530
7501
TDA9320H
HIP
ERR 38
7991
M24C04
NVM
ERR 39
M2 SELECTOR SWITCHES
7860
PCF8574TS
I/O EXP
ERR 36
M4 DUAL SCREEN +MEMORY
3757
3756
7700
SAB9079H
DW PROC. (POPOV)
ERR 37
M5 AUDIO
7620
TDA7309
AUDIO PROC.
ERR 41
K8 SOURCE SELECTION
0371
AV4 VGA/HD SELECTION
0371
AV8 AUDIO + CONTROL
3822
3824
7810
TEA6422D
ELECTRONIC SWITCH
ERR 31
3882
3881
7880
PCF8574AT
I/O EXPANDER
ERR 27
AV7 VIDEO SELECTION
3722
3723
7710
TEA6415CD-TR
ELECTRONIC SWITCH
ERR 30

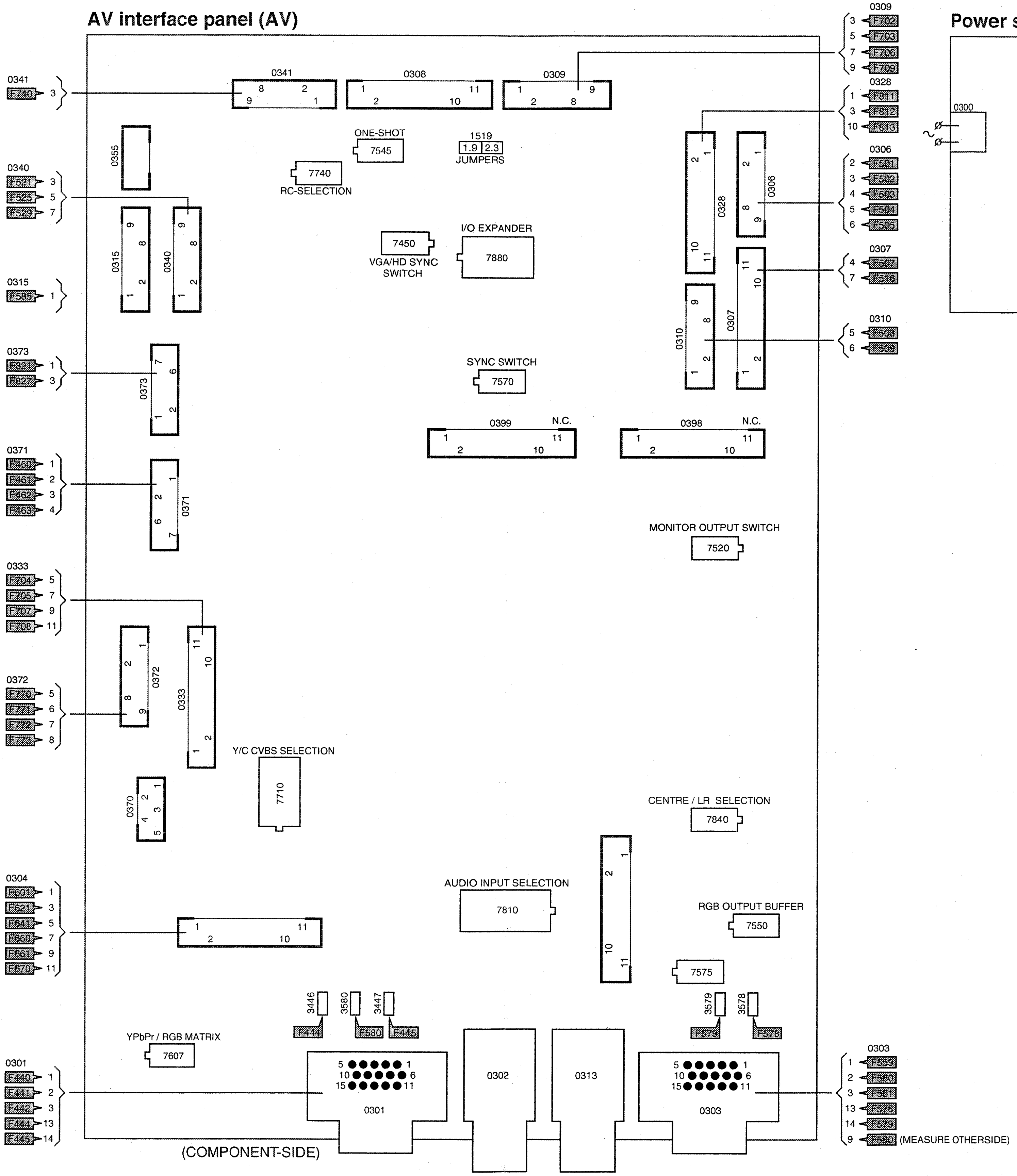
Error	Device	Description	Def. item	Diag
2	ST24E32	NVM (Non Volatile memory	IC7008	K7
3	SAA5800	OTC2.5 microprocessor	IC7003	K7
5	UV1336	Tuner	U1102	K1
10	TEA6415	I/O select video	IC7208	K8
11	TEA6422	I/O select audio	IC7777	K8
15	TDA9320	HIP I/O-video processing	IC7501	K1
20	TDA9330	HOP video control/geometry	IC7300	K6
21	TDA9178	LTP Peaking	IC7402	K6
25	MSP3440	ITT sound processor (MSP)	IC7751	K3
27	PCF8574	I/O select audio	IC7880	AV8
30	TEA6415	Video selection switch	IC7710	AV7
31	TEA6422	Audio selection switch	IC7810	AV8
35	UV1336	FDS Tuner	U1102	M1
36	PCF8574	FDS Expander	IC7860	M2
37	SAB9079	FDS Processor (POPOV)	IC7700	M4
38	TDA9320	FDS Video HIP Processor (HIP2)	IC7501	M1
39	ST24C04	FDS NVM	IC7991	M1
41	TDA7309	FDS Headphone	IC7620	M5
50	SAA4978	FBX PICNIC	IC7611	L1
52	T8F24EF	EAGLE	IC7724	L2
53	SAA4992	FBX FALCONIC	IC7626	L3
65	Slow I²C bus blocked			
66	Fast I²C bus blocked			
67	Supply 5V	5V2		K7
68	Supply 8V	8V6		K7
77	Feature box protection	FBX-PROT		L1
80	Tuner protection	TUNER-PROT		

NOTE 1) MESSAGE BASED ERRORS ARE RETRIEVABLE VIA COMPAIR TOOL VIA SET, IN THE ERRORBUFFER FOLLOWING ERRORS CAN OCCUR:

CL 36532013_009.eps
160403

Testpoint Overviews (AV + PS)

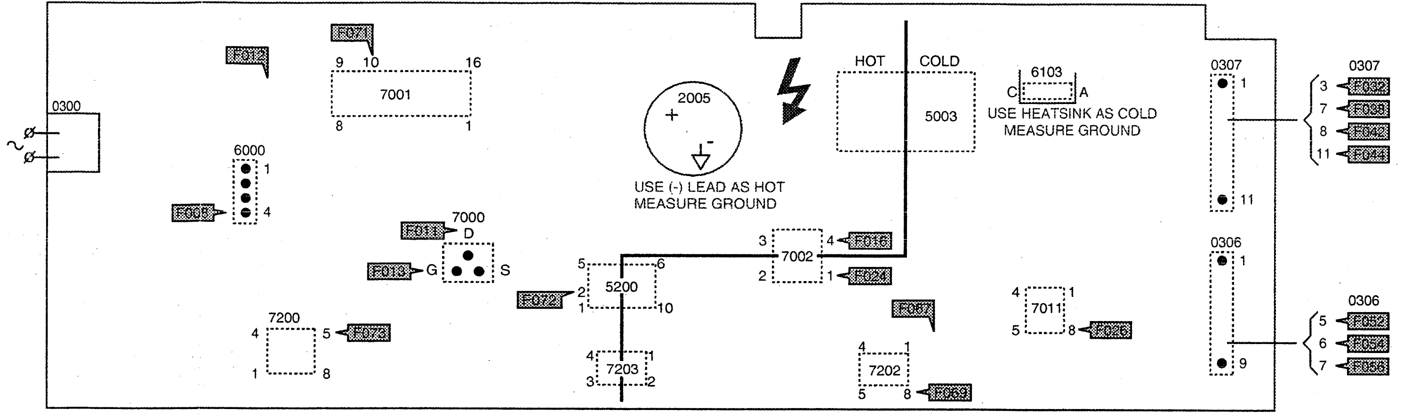
AV interface panel (AV)

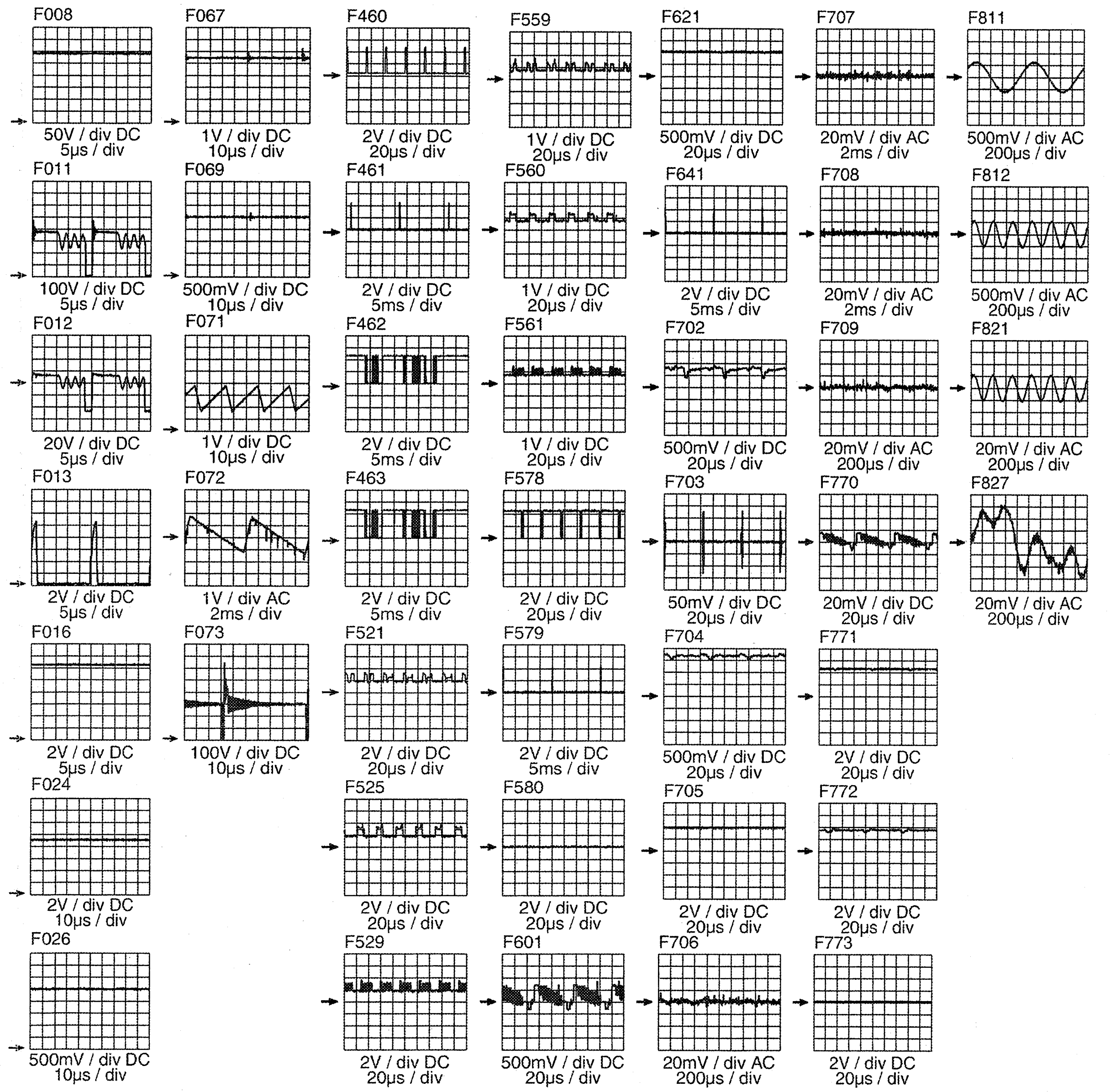

0341 F740 3
0340 F521 3 F525 5 F529 7
0315 F585 1
0373 F821 1 F827 3
0371 F460 1 F461 2 F462 3 F463 4
0333 F704 5 F705 7 F707 9 F706 11
0372 F770 5 F771 6 F772 7 F773 8
0304 F601 1 F621 3 F641 5 F660 7 F661 9 F670 11
0301 F440 1 F441 2 F442 3 F444 13 F445 14
0309 3 F702 5 F703 7 F708 9 F709
0328 1 F811 3 F812 10 F813
0306 2 F501 3 F502 4 F503 5 F504 6 F505
0307 4 F507 7 F516
0310 5 F508 6 F509
0303 1 F559 2 F560 3 F561 13 F578 14 F579 9 F580 (MEASURE OTHERSIDE)
0341 0308 0309 0355 0315 0340 0373 0371 0372 0333 0370 0328 0306 0310 0307 0399 0398 0301 0302 0313 0303
N.C.
ONE-SHOT 7545
1519 1.9 2.3 JUMPERS
7740 RC-SELECTION
7450 VGA/HD SYNC SWITCH
I/O EXPANDER 7880
SYNC SWITCH 7570
MONITOR OUTPUT SWITCH 7520
Y/C CVBS SELECTION 7710
CENTRE / LR SELECTION 7840
AUDIO INPUT SELECTION 7810
RGB OUTPUT BUFFER 7550
7575
3446 3580 3447 F444 F580 F445
3579 3578 F579 F578
YPbPr / RGB MATRIX 7607

(COMPONENT-SIDE)

Power supply panel (PS)

(COPPER TRACK SIDE)

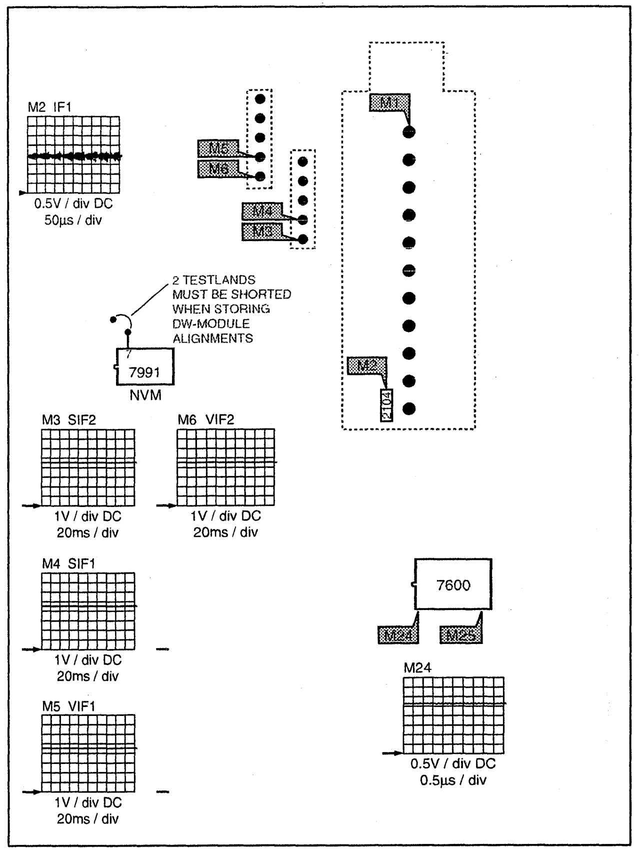

0300
F012 F071
7001 9 10 16 8 1
6000 1 4 F008
7000 D G S F011 F013
7200 4 5 1 8 F073
2005
USE (-) LEAD AS HOT MEASURE GROUND
HOT COLD
5003
6103 C A
USE HEATSINK AS COLD MEASURE GROUND
5200 F072
7002 3 4 2 1 F016 F024
7203
7011 F026
7202 F069 F067
0307 3 F032 7 F038 8 F042 11 F044
0306 5 F052 6 F054 7 F056



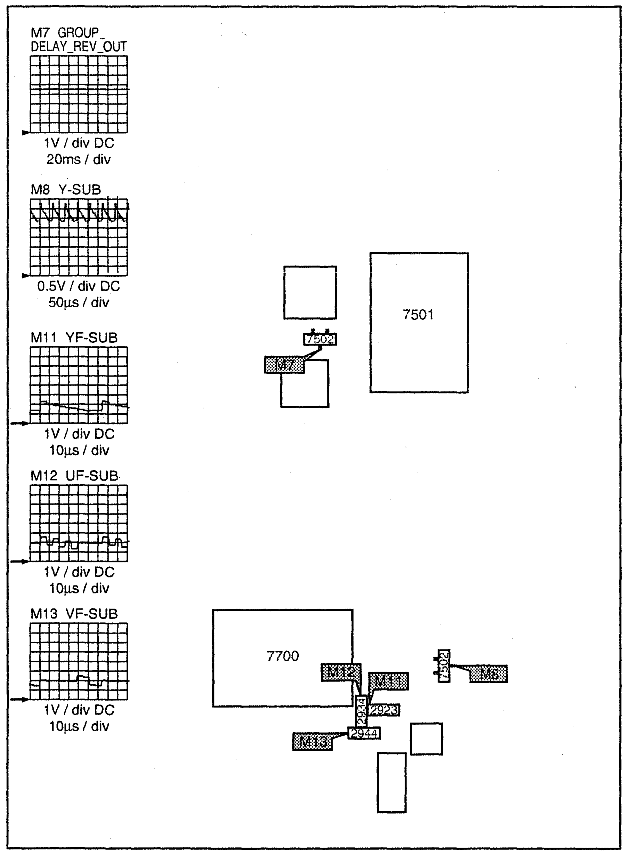
CL 36532013_025.eps
110303

Testpoint Overviews (K + L + M)

FDS module (M)

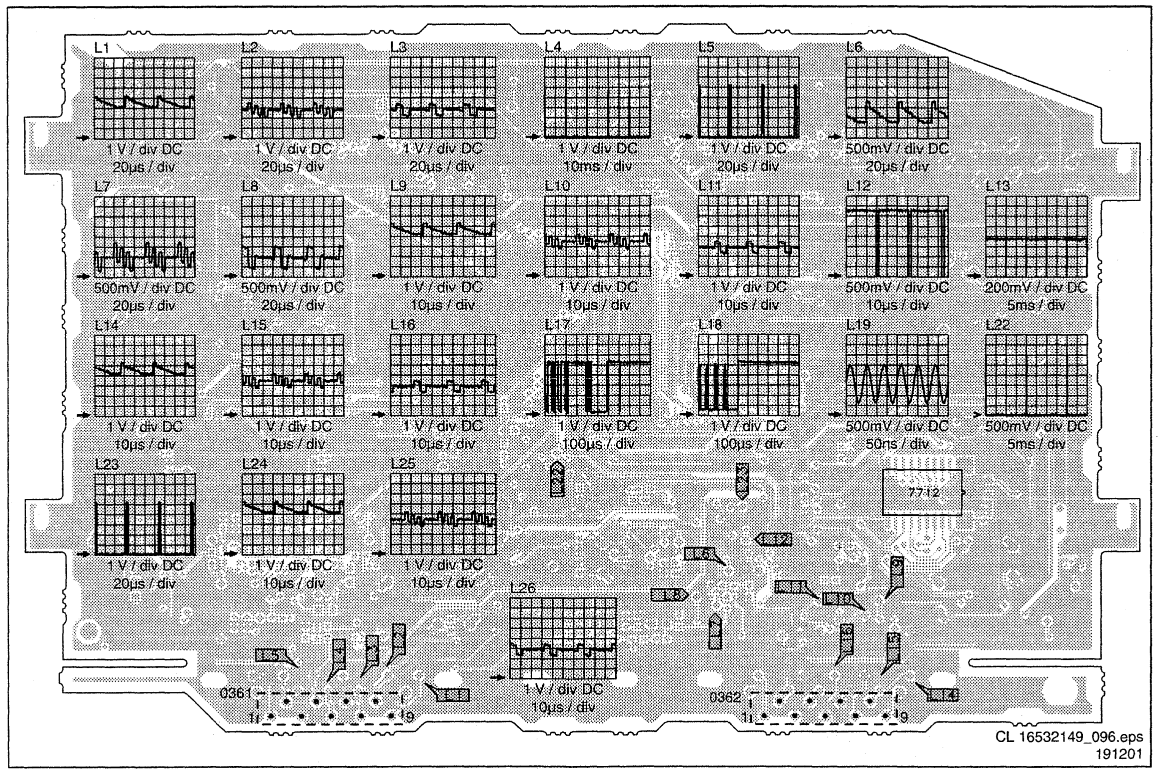

M2 IF1
0.5V / div DC
50µs / div
M1
M5
M6
M4
M3
M2
2 TESTLANDS MUST BE SHORTED WHEN STORING DW-MODULE ALIGNMENTS
7991
NVM
M3 SIF2
1V / div DC
20ms / div
M6 VIF2
1V / div DC
20ms / div
M4 SIF1
1V / div DC
20ms / div
M5 VIF1
1V / div DC
20ms / div
7600
M24
M25
M24
0.5V / div DC
0.5µs / div

(COPPER -SIDE)


M7 GROUP_DELAY_REV_OUT
1V / div DC
20ms / div
M8 Y-SUB
0.5V / div DC
50µs / div
M11 YF-SUB
1V / div DC
10µs / div
M12 UF-SUB
1V / div DC
10µs / div
M13 VF-SUB
1V / div DC
10µs / div
7501
M7
7700
M12
M11
M13
M8

(COMPONENT-SIDE)

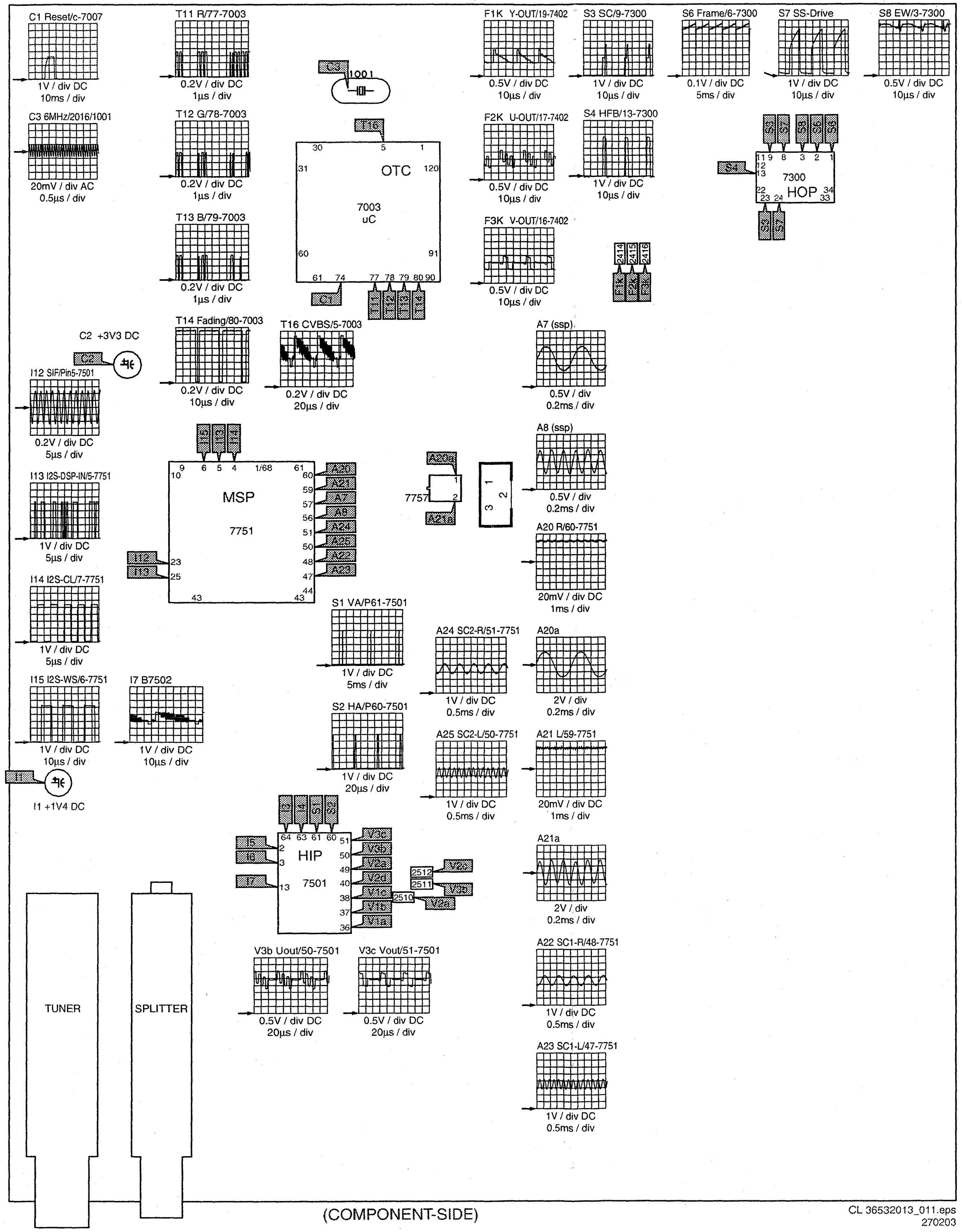
FBX panel (L)


L1
1 V / div DC
20µs / div
L2
1 V / div DC
20µs / div
L3
1 V / div DC
20µs / div
L4
1 V / div DC
10ms / div
L5
1 V / div DC
20µs / div
L6
500mV / div DC
20µs / div
L7
500mV / div DC
20µs / div
L8
500mV / div DC
20µs / div
L9
1 V / div DC
10µs / div
L10
1 V / div DC
10µs / div
L11
1 V / div DC
10µs / div
L12
500mV / div DC
10µs / div
L13
200mV / div DC
5ms / div
L14
1 V / div DC
10µs / div
L15
1 V / div DC
10µs / div
L16
1 V / div DC
10µs / div
L17
1 V / div DC
100µs / div
L18
1 V / div DC
100µs / div
L19
500mV / div DC
50ns / div
L22
500mV / div DC
5ms / div
L23
1 V / div DC
20µs / div
L24
1 V / div DC
10µs / div
L25
1 V / div DC
10µs / div
L26
1 V / div DC
10µs / div
7712
0361
0362
1
9

CL 16532149_096.eps
191201

(COPPER-SIDE)

Small signal panel (K)

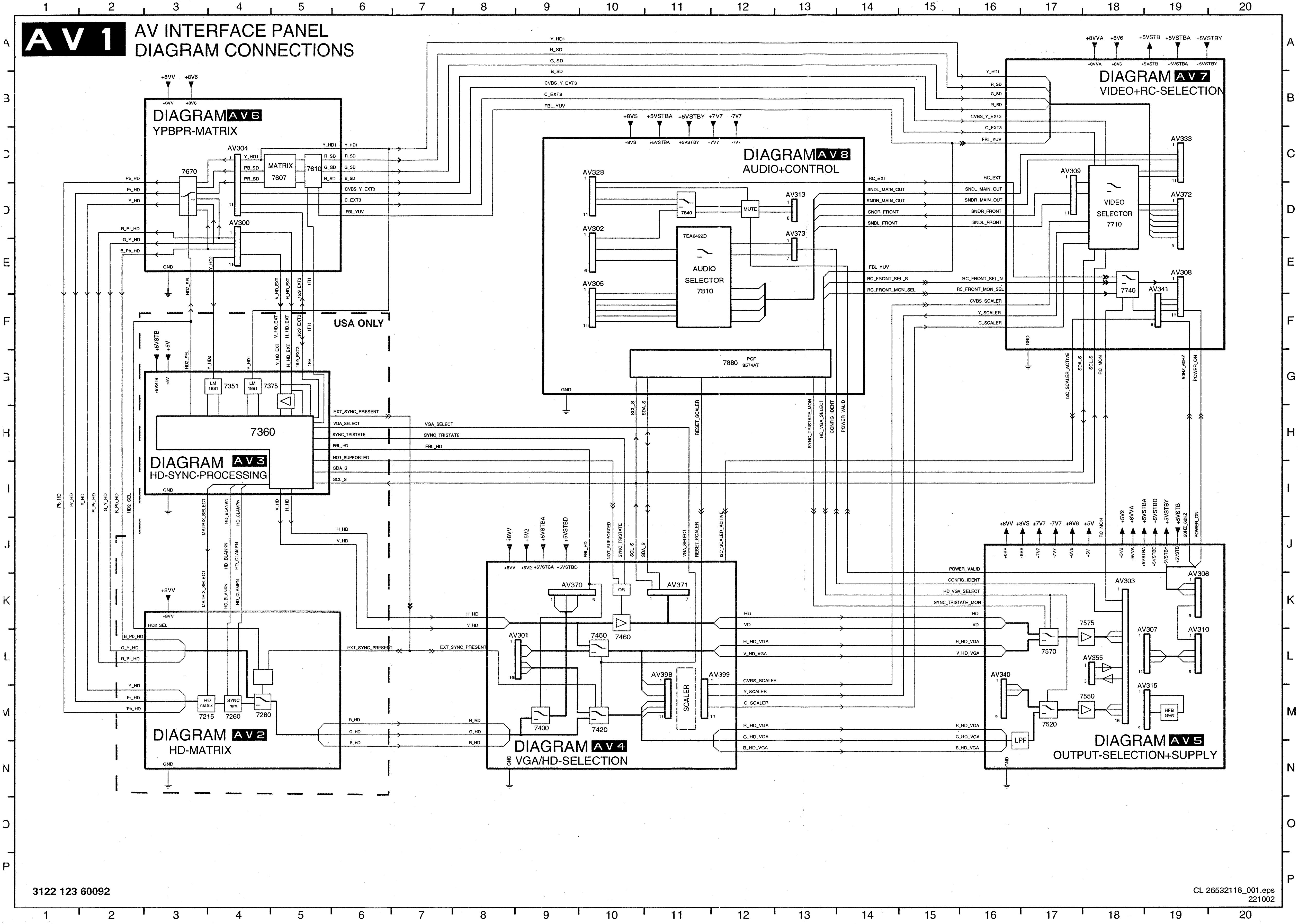

C1 Reset/c-7007
1V / div DC
10ms / div
C3 6MHz/2016/1001
20mV / div AC
0.5µs / div
T11 R/77-7003
0.2V / div DC
1µs / div
T12 G/78-7003
0.2V / div DC
1µs / div
T13 B/79-7003
0.2V / div DC
1µs / div
T14 Fading/80-7003
0.2V / div DC
10µs / div
T16 CVBS/5-7003
0.2V / div DC
20µs / div
C3
1001
T16
OTC
7003
uC
C1
T11 T12 T13 T14
F1K Y-OUT/19-7402
0.5V / div DC
10µs / div
F2K U-OUT/17-7402
0.5V / div DC
10µs / div
F3K V-OUT/16-7402
0.5V / div DC
10µs / div
S3 SC/9-7300
1V / div DC
10µs / div
S4 HFB/13-7300
1V / div DC
10µs / div
S6 Frame/6-7300
0.1V / div DC
5ms / div
S7 SS-Drive
1V / div DC
10µs / div
S8 EW/3-7300
0.5V / div DC
10µs / div
7300
HOP
S4
2414 2415 2416
F1K F2K F3K
C2 +3V3 DC
C2
I12 SIF/Pin5-7501
0.2V / div DC
5µs / div
I13 I2S-DSP-IN/5-7751
1V / div DC
5µs / div
I14 I2S-CL/7-7751
1V / div DC
5µs / div
I15 I2S-WS/6-7751
1V / div DC
10µs / div
I7 B7502
1V / div DC
10µs / div
I1
I1 +1V4 DC
MSP
7751
I12
I13
A30 A21 A7 A8 A24 A25 A22 A23
A20a
A21a
7757
A7 (ssp)
0.5V / div
0.2ms / div
A8 (ssp)
0.5V / div
0.2ms / div
A20 R/60-7751
20mV / div DC
1ms / div
A20a
2V / div
0.2ms / div
A21 L/59-7751
20mV / div DC
1ms / div
A21a
2V / div
0.2ms / div
A22 SC1-R/48-7751
1V / div DC
0.5ms / div
A23 SC1-L/47-7751
1V / div DC
0.5ms / div
A24 SC2-R/51-7751
1V / div DC
0.5ms / div
A25 SC2-L/50-7751
1V / div DC
0.5ms / div
S1 VA/P61-7501
1V / div DC
5ms / div
S2 HA/P60-7501
1V / div DC
20µs / div
HIP
7501
I5 I6 I7
I3 I4 S1 S2
V3c V3b V2a V2d V1c V1b V1a
2512 2511 2510
V2c V3b V2a
V3b Uout/50-7501
0.5V / div DC
20µs / div
V3c Vout/51-7501
0.5V / div DC
20µs / div
TUNER
SPLITTER

(COMPONENT-SIDE)

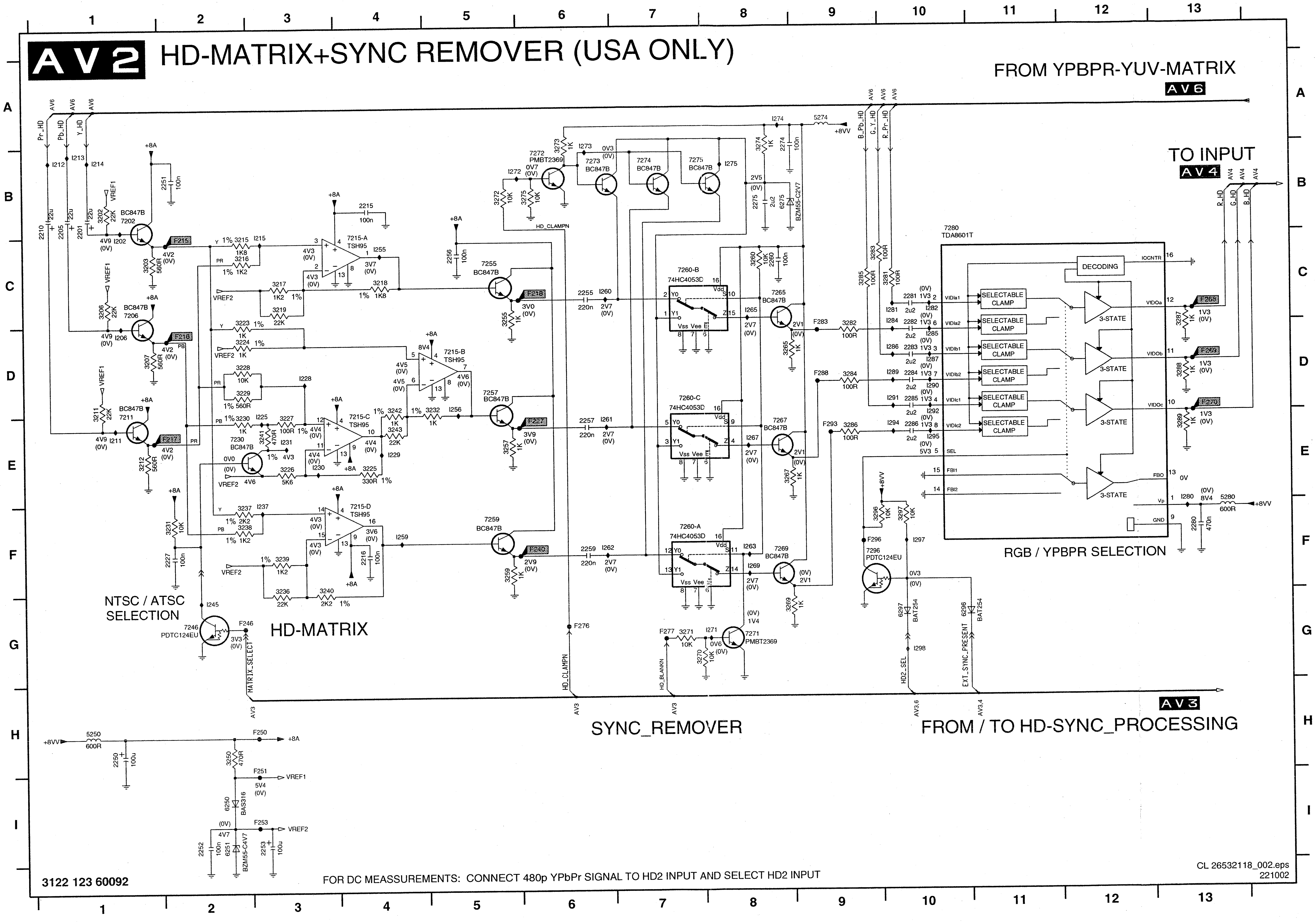
CL 36532013_011.eps
270203

7. Circuit Diagrams and PWB Layouts

AV Interface Panel


AV 1
AV INTERFACE PANEL
DIAGRAM CONNECTIONS
DIAGRAM AV6
YPBPR-MATRIX
AV304
AV300
7670
MATRIX 7607
7610
DIAGRAM AV8
AUDIO+CONTROL
AV328
AV302
AV305
AV313
AV373
TEA6422D
AUDIO SELECTOR 7810
7840
MUTE
7880 PCF 8574AT
DIAGRAM AV7
VIDEO+RC-SELECTION
AV309
VIDEO SELECTOR 7710
AV333
AV372
AV308
AV341
7740
USA ONLY
DIAGRAM AV3
HD-SYNC-PROCESSING
7360
LM 1881 7351
LM 1881 7375
DIAGRAM AV2
HD-MATRIX
HD matrix 7215
SYNC sep. 7260
7280
DIAGRAM AV4
VGA/HD-SELECTION
AV370
AV371
OR
7460
7450
AV301
7400
7420
AV398
SCALER
AV399
DIAGRAM AV5
OUTPUT-SELECTION+SUPPLY
AV303
AV306
7575
7570
AV307
AV310
AV355
AV340
7550
7520
AV315
HFB GEN
LPF
+8VV
+8V6
+8VS
+5VSTBA
+5VSTBY
+7V7
-7V7
+8VVA
+5VSTB
+5V
+5V2
+5VSTBD
GND
Y_HD1
R_SD
G_SD
B_SD
CVBS_Y_EXT3
C_EXT3
FBL_YUV
PB_SD
PR_SD
Pb_HD
Pr_HD
Y_HD
R_Pr_HD
G_Y_HD
B_Pb_HD
HD2_SEL
Y_HD2
V_HD_EXT
H_HD_EXT
16:9_EXT3
1FH
RC_EXT
SNDL_MAIN_OUT
SNDR_MAIN_OUT
SNDR_FRONT
SNDL_FRONT
RC_FRONT_SEL_N
RC_FRONT_MON_SEL
CVBS_SCALER
Y_SCALER
C_SCALER
I2C_SCALER_ACTIVE
SDA_S
SCL_S
RC_MON
50HZ_60HZ
POWER_ON
EXT_SYNC_PRESENT
VGA_SELECT
SYNC_TRISTATE
FBL_HD
NOT_SUPPORTED
RESET_SCALER
SYNC_TRISTATE_MON
HD_VGA_SELECT
CONFIG_IDENT
POWER_VALID
MATRIX_SELECT
HD_BLANKN
HD_CLAMPN
V_HD
H_HD
HD
VD
H_HD_VGA
V_HD_VGA
R_HD
G_HD
B_HD
R_HD_VGA
G_HD_VGA
B_HD_VGA
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N O P
3122 123 60092
CL 26532118_001.eps
221002

AV Interface Panel: HD Matrix + Sync Remover (USA only)


AV2
HD-MATRIX+SYNC REMOVER (USA ONLY)
FROM YPBPR-YUV-MATRIX
AV6
TO INPUT
AV4
Pr_HD
Pb_HD
Y_HD
B_Pb_HD
G_Y_HD
R_Pr_HD
R_HD
G_HD
B_HD
BC847B 7202
BC847B 7206
BC847B 7211
7215-A TSH95
7215-B TSH95
7215-C TSH95
7215-D TSH95
7230 BC847B
7255 BC847B
7257 BC847B
7259 BC847B
7260-A 74HC4053D
7260-B 74HC4053D
7260-C 74HC4053D
7265 BC847B
7267 BC847B
7269 BC847B
7271 PMBT2369
7272 PMBT2369
7273 BC847B
7274 BC847B
7275 BC847B
7280 TDA8601T
DECODING
SELECTABLE CLAMP
3-STATE
7246 PDTC124EU
7296 PDTC124EU
BZM55-C2V7
BAT254
BAS316
BZM55-C4V7
HD_CLAMPN
HD_BLANKN
MATRIX_SELECT
HD2_SEL
EXT_SYNC_PRESENT
NTSC / ATSC SELECTION
HD-MATRIX
SYNC_REMOVER
RGB / YPBPR SELECTION
FROM / TO HD-SYNC_PROCESSING
AV3
VREF1
VREF2
+8A
+8VV
1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I

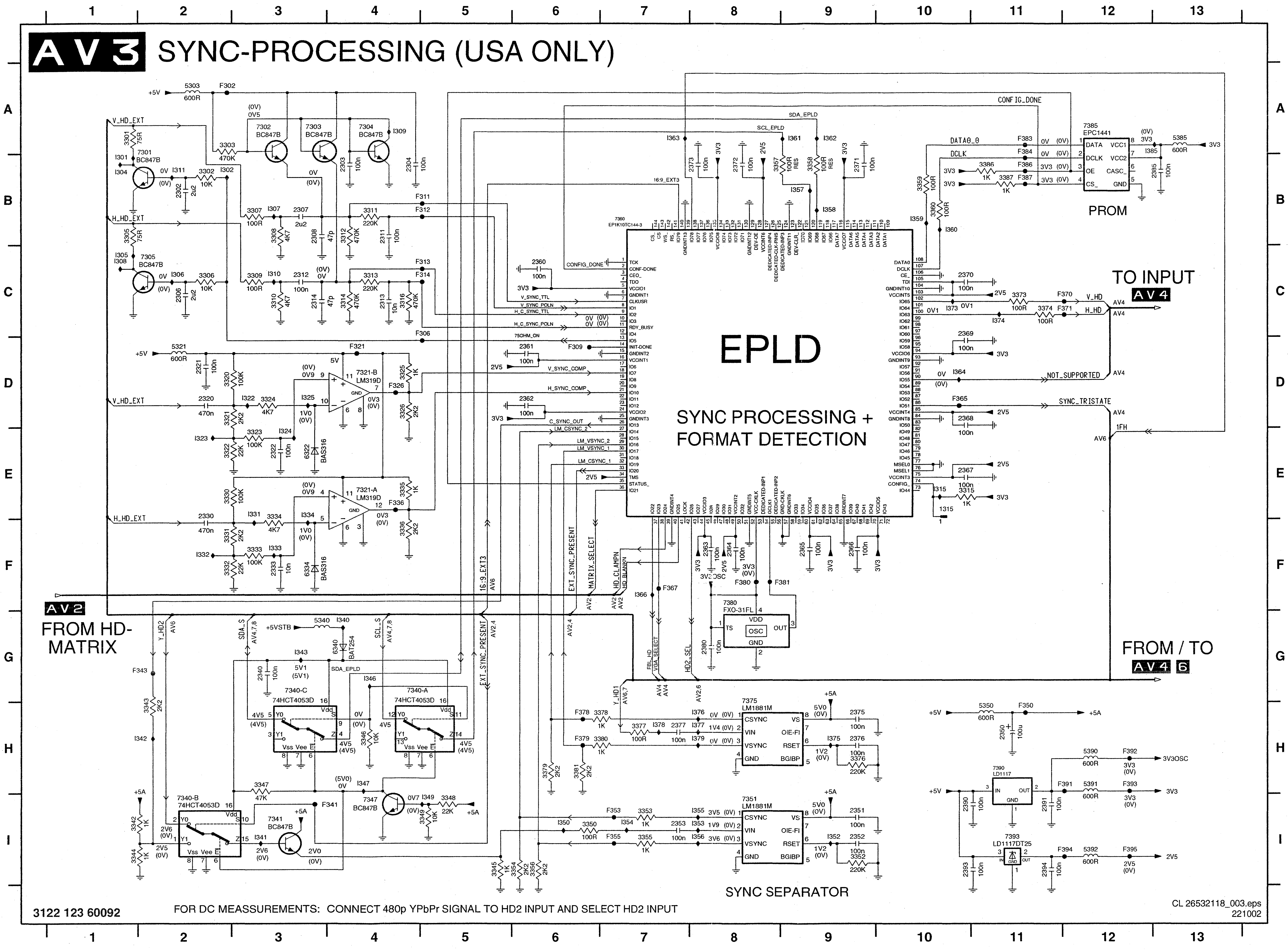
3122 123 60092

FOR DC MEASSUREMENTS: CONNECT 480p YPbPr SIGNAL TO HD2 INPUT AND SELECT HD2 INPUT

CL 26532118_002.eps
221002

2201	B1
2205	B1
2210	B1
2215	B4
2216	F4
2227	F2
2250	H1
2251	B2
2252	I2
2253	I3
2255	C6
2256	C5
2257	E6
2259	F6
2260	C8
2274	B8
2275	B8
2280	F13
2281	C10
2282	D10
2283	D10
2284	D10
2285	D10
2286	E10
3202	B1
3203	C1
3206	C1
3207	D1
3211	D1
3212	E1
3215	C2
3216	C2
3217	C3
3218	C4
3219	C3
3223	C2
3224	D2
3225	E4
3226	E3
3227	E3
3228	D2
3229	D2
3230	E2
3231	F2
3232	D5
3236	F3
3237	F2
3238	F2
3239	F3
3240	F3
3241	E3
3242	D4
3243	E4
3250	H2
3255	C5
3257	E5
3259	F5
3260	C8
3265	D8
3267	E8
3269	G8
3270	G7
3271	G7
3272	B5
3273	B6
3274	B8
3275	B6
3281	C10
3282	D9
3283	C9
3284	D9
3285	C9
3286	E9
3287	D13
3288	D13
3289	E13
3296	F9
3297	F10
5250	H1
5274	A9
5280	F13
6250	I2
6251	I2
6275	B8
6296	G10
6297	G10
7202	B1
7206	C1
7211	E1
7215-A	C4
7215-B	D5
7215-C	E4
7215-D	F4
7230	E2
7246	G2
7255	C5
7257	D5
7259	F5
7260-A	F7
7260-B	C7
7260-C	D7
7265	C8
7267	E8
7269	F8
7271	G8
7272	B6
7273	B6
7274	B7
7275	B7
7280	B10
7296	F9
F215	C2
F216	D2
F217	E2
F218	C6
F227	E6
F240	F6
F246	G2
F250	H3
F251	H3
F253	I3
F268	C13
F269	D13
F270	D13
F276	G6
F277	G7
F283	C9
F288	D9
F293	E9
F296	F9
I202	C1
I206	D1
I211	E1
I212	B1
I213	B1
I214	B1
I215	B3
I225	D3
I228	D3
I229	E4
I230	E3
I231	E3
I237	E3
I245	G2
I255	C4
I256	D5
I259	F4
I260	C6
I261	E6
I262	F6
I263	F8
I265	C8
I267	E8
I269	F8
I271	G8
I272	B5
I273	B6
I274	A8
I275	B8
I280	E13
I281	C10
I282	C10
I284	C10
I285	D10
I286	D10
I287	D10
I289	D10
I290	D10
I291	D10
I292	E10
I294	E10
I295	E10
I297	F10
I298	G10

AV Interface Panel: Sync Processing (USA only)


AV3
SYNC-PROCESSING (USA ONLY)
EPLD
SYNC PROCESSING +
FORMAT DETECTION
7360
EP1K10TC144-3
PROM
7385
EPC1441
CONFIG_DONE
SDA_EPLD
SCL_EPLD
DATA0_0
DCLK
TO INPUT
AV4
V_HD
H_HD
NOT_SUPPORTED
SYNC_TRISTATE
1FH
AV6
V_HD_EXT
H_HD_EXT
7301
BC847B
7302
BC847B
7303
BC847B
7304
BC847B
7305
BC847B
7321-B
LM319D
7321-A
LM319D
6322
BAS316
6334
BAS316
6340
BAT254
AV2
FROM HD-
MATRIX
7340-C
74HCT4053D
7340-A
74HCT4053D
7340-B
74HCT4053D
7341
BC847B
7347
BC847B
7380
FXO-31FL
OSC
7375
LM1881M
7351
LM1881M
CSYNC
VIN
VSYNC
GND
VS
OIE-FI
RSET
BGIBP
SYNC SEPARATOR
FROM / TO
AV4 6
7390
LD1117
7393
LD1117DT25
+5V
+5A
3V3
2V5
3V3OSC
EXT_SYNC_PRESENT
MATRIX_SELECT
HD_CLAMPN
HD_BLANKN
16:9_EXT3
FBL_HD
VGA_SELECT
HD2_SEL
Y_HD2
Y_HD1
SDA_S
SCL_S
1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I

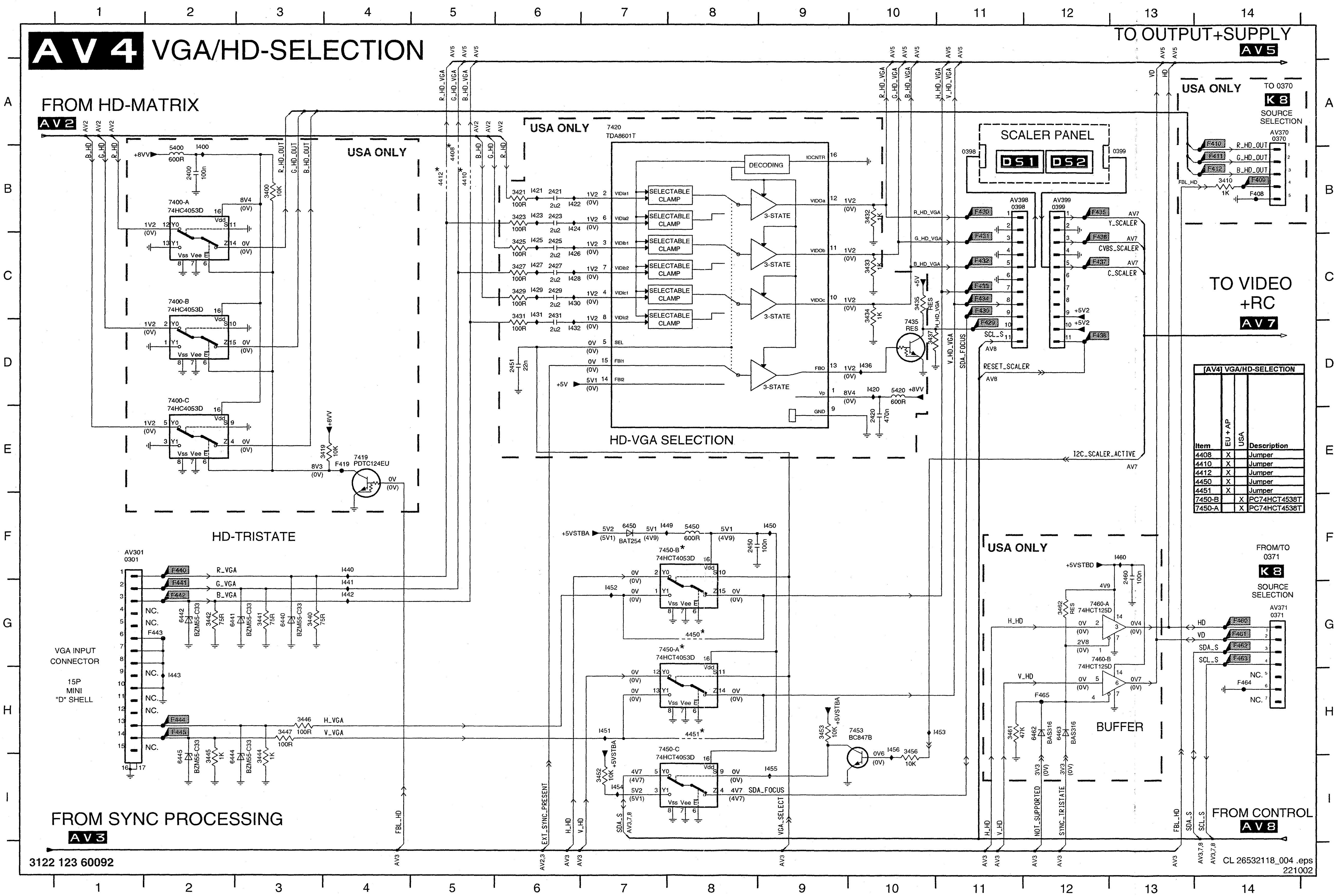
3122 123 60092

FOR DC MEASSUREMENTS: CONNECT 480p YPbPr SIGNAL TO HD2 INPUT AND SELECT HD2 INPUT

CL 26532118_003.eps
221002

1315	E10
2302	B2
2303	B4
2304	B4
2306	C2
2307	B3
2308	B3
2311	B4
2312	C3
2313	C4
2314	C3
2320	D2
2321	D2
2322	E3
2330	E2
2333	F3
2340	G3
2350	H11
2351	I9
2352	I9
2353	I8
2360	C6
2361	D6
2362	D6
2363	F8
2364	F8
2365	F9
2366	F9
2367	E10
2368	D11
2369	C10
2370	C11
2371	B9
2372	B8
2373	B8
2375	H9
2376	H9
2377	H8
2380	G8
2385	B12
2390	I10
2391	I11
2393	I10
2394	I11
3301	A1
3302	B2
3303	A2
3305	B1
3306	C2
3307	B3
3308	B3
3309	C3
3310	C3
3311	B4
3312	B4
3313	C4
3314	C4
3315	E10
3316	C4
3320	D2
3321	D2
3322	E2
3323	E3
3324	D3
3325	D4
3326	D4
3330	E2
3331	F2
3332	F2
3333	F3
3334	E3
3335	E4
3336	F4
3342	I1
3343	H2
3344	I1
3345	I5
3346	H4
3347	H3
3348	I5
3349	I5
3350	I7
3352	I9
3353	I7
3354	I6
3355	I7
3356	I6
3357	B8
3358	B9
3359	B10
3360	B10
3373	C11
3374	C11
3376	H9
3377	H7
3378	H7
3379	H6
3380	H7
3381	H6
3386	B11
3387	B11
5303	A2
5321	D2
5340	G3
5350	H11
5385	A13
5390	H12
5391	H12
5392	I12
6322	E3
6334	F3
6340	G4
7301	B2
7302	A3
7303	A3
7304	A4
7305	C2
7321-A	E4
7321-B	D4
7340-A	G4
7340-B	I2
7340-C	G3
7341	I3
7347	I4
7351	I8
7360	B7
7375	H8
7380	F8
7385	A12
7390	H11
7393	I11
F302	A2
F306	C5
F309	D6
F311	B5
F312	B5
F313	C5
F314	C5
F321	D4
F326	D4
F336	E4
F341	I4
F343	G2
F350	H11
F353	I7
F355	I7
F365	D10
F367	F7
F370	C12
F371	C12
F378	H6
F379	H6
F380	F8
F381	F9
F383	A11
F384	A11
F386	B11
F387	B11
F391	H12
F392	H12
F393	H12
F394	I12
F395	I12
I301	B1
I302	B2
I304	B1
I305	C1
I306	C2
I307	B3
I308	C1
I309	A4
I310	C3
I311	B2
I315	E10
I322	D3
I323	E2
I324	E3
I325	D3
I331	E3
I332	F2
I333	F3
I334	E3
I340	G4
I341	I3
I342	H2
I343	G3
I346	G4
I347	H4
I349	I5
I350	I6
I352	I9
I353	I8
I354	I7
I355	I8
I356	I8
I357	B9
I358	B9
I359	B10
I360	C10
I361	A9
I362	A9
I363	A7
I364	D10
I366	F7
I373	C10
I374	C11
I375	H9
I376	H8
I377	H8
I378	H7
I379	H8
I385	A12

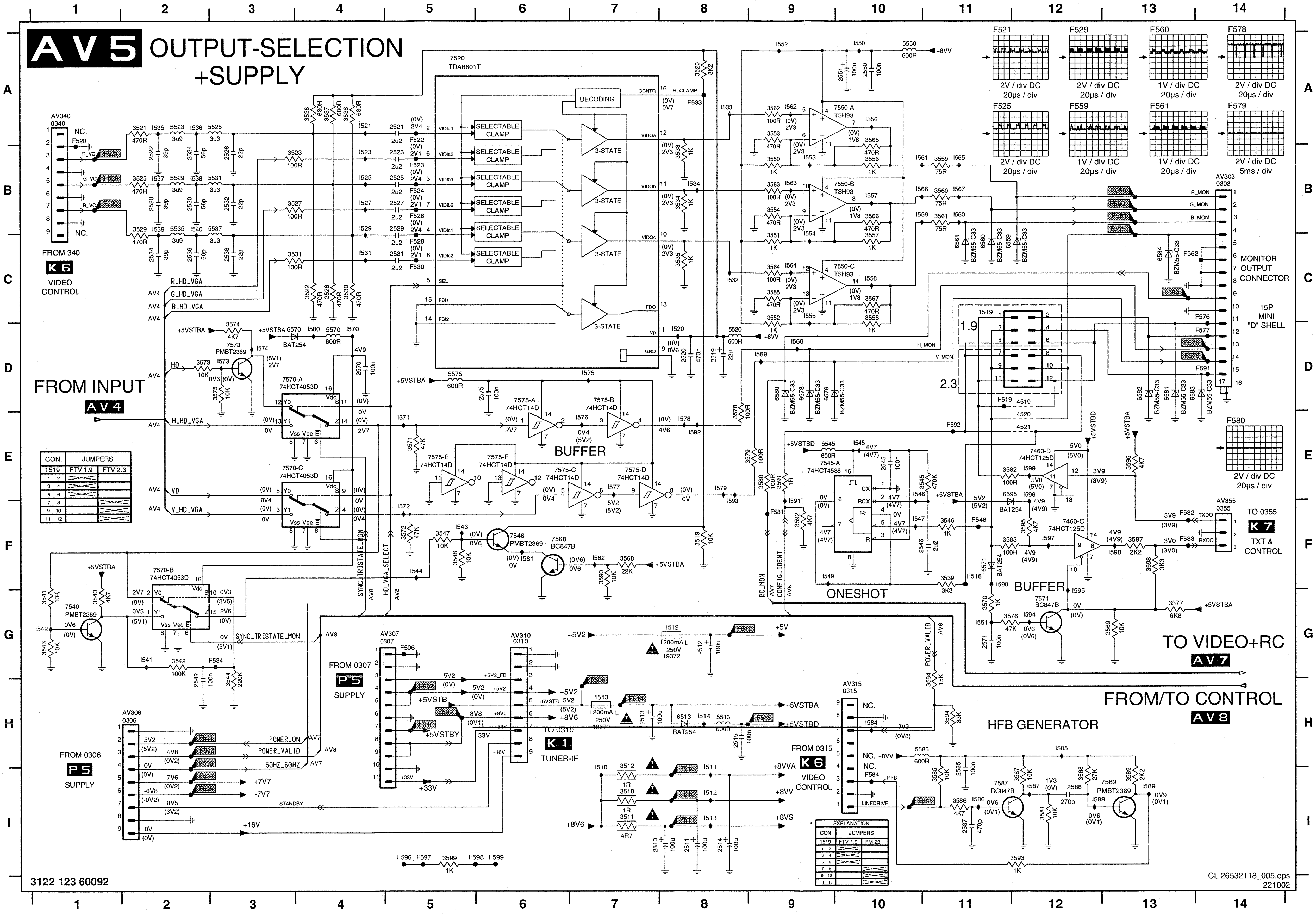
AV Interface Panel: VGA / HD Selection


AV4
VGA/HD-SELECTION
FROM HD-MATRIX
AV2
TO OUTPUT+SUPPLY
AV5
USA ONLY
7420
TDA8601T
DECODING
SELECTABLE CLAMP
3-STATE
HD-VGA SELECTION
SCALER PANEL
DS1
DS2
AV398
0398
AV399
0399
TO 0370
K8
SOURCE SELECTION
AV370
0370
TO VIDEO +RC
AV7
7400-A 74HC4053D
7400-B 74HC4053D
7400-C 74HC4053D
7419 PDTC124EU
7435
HD-TRISTATE
AV301
0301
VGA INPUT CONNECTOR
15P MINI "D" SHELL
7450-B 74HCT4053D
7450-A 74HCT4053D
7450-C 74HCT4053D
7453 BC847B
7460-A 74HCT125D
7460-B 74HCT125D
BUFFER
FROM/TO 0371
K8
SOURCE SELECTION
AV371
0371
FROM SYNC PROCESSING
AV3
FROM CONTROL
AV8
3122 123 60092
CL 26532118_004 .eps
221002

[AV4] VGA/HD-SELECTION			
Item	EU + AP	USA	Description
4408	X		Jumper
4410	X		Jumper
4412	X		Jumper
4450	X		Jumper
4451	X		Jumper
7450-B		X	PC74HCT4538T
7450-A		X	PC74HCT4538T

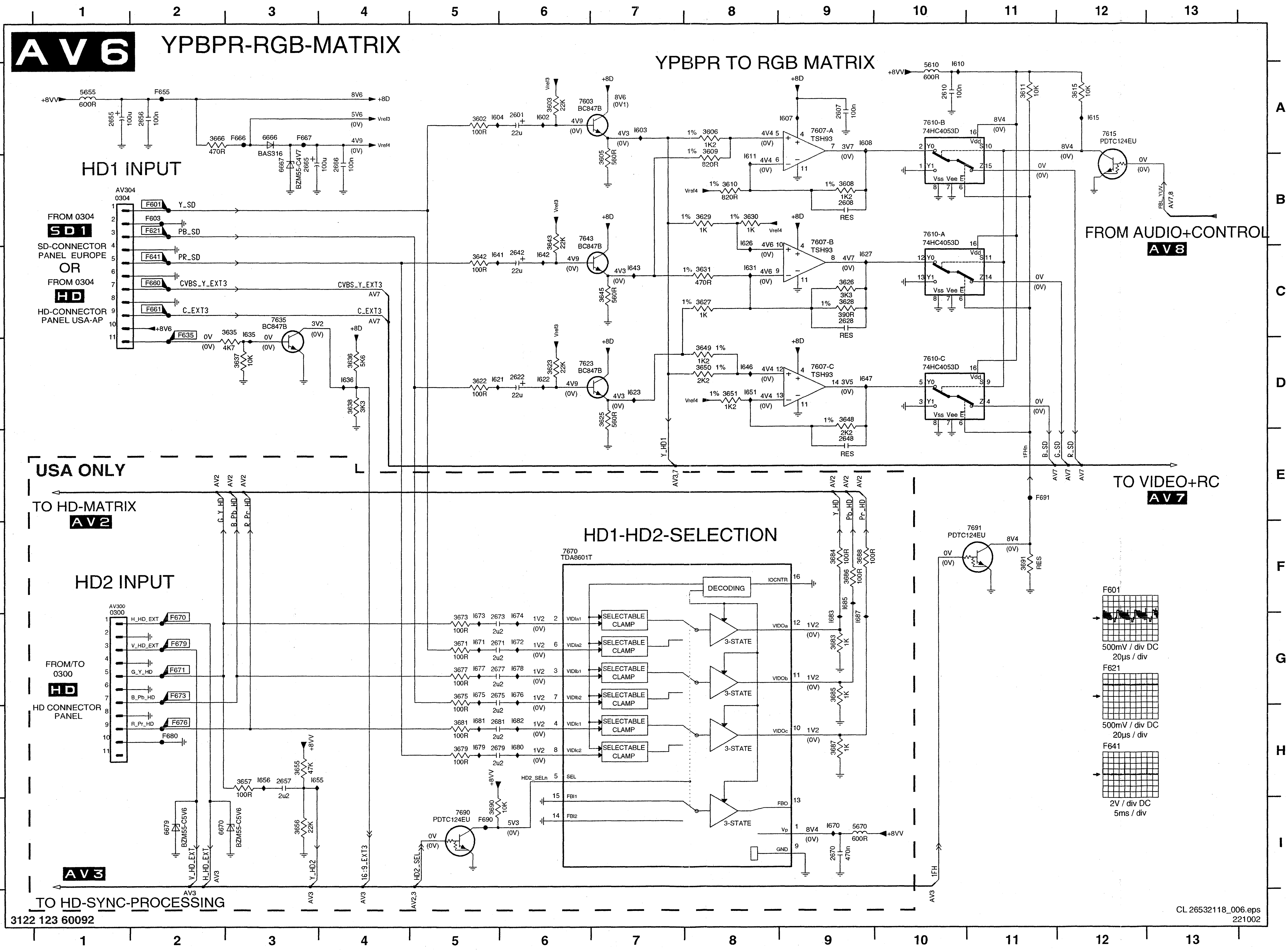
0301	F1
0370	A14
0371	G14
0398	B11
0399	B12
2400	B2
2420	E10
2421	B6
2423	B6
2425	C6
2427	C6
2429	C6
2431	C6
2450	F8
2451	D6
2460	F13
3400	B3
3410	B14
3419	E4
3421	B6
3423	B6
3425	C6
3427	C6
3429	C6
3431	C6
3432	B10
3433	C10
3434	C10
3435	C10
3437	D10
3440	G3
3441	G3
3442	G2
3444	I3
3445	I2
3446	H3
3447	H3
3452	I7
3453	H9
3456	H10
3461	H11
3462	G12
4408	B5
4410	B5
4412	B5
4450	G8
4451	H8
5400	B2
5420	D10
5450	F8
6440	G3
6441	G2
6442	G2
6444	I2
6445	I2
6450	F7
6462	H12
6463	H12
7400-A	B2
7400-B	C2
7400-C	D2
7419	E4
7420	A7
7435	D10
7450-A	G8
7450-B	F8
7450-C	H8
7453	H10
7460-A	G12
7460-B	G12
F408	B14
F409	B14
F410	A14
F411	B14
F412	B14
F419	E4
F429	D11
F430	B11
F431	C11
F432	C11
F433	C11
F434	C11
F435	B12
F436	C12
F437	C12
F438	D12
F439	C11
F440	F2
F441	G2
F442	G2
F443	G2
F444	H2
F445	H2
F460	G14
F461	G14
F462	G14
F463	G14
F464	H14
F465	H12
I400	B2
I420	D10
I421	B6
I422	B6
I423	B6
I424	B6
I425	C6
I426	C6
I427	C6
I428	C6
I429	C6
I430	C6
I431	C6
I432	D6
I436	D10
I440	F4
I441	G4
I442	G4
I443	H2
I449	F7
I450	F9
I451	H7
I452	G7
I453	H11
I454	I7
I455	I9
I456	H10

AV Interface Panel: Output Selection + Supply


AV5 OUTPUT-SELECTION
+SUPPLY
7520
TDA8601T
DECODING
SELECTABLE CLAMP
3-STATE
FROM INPUT
AV4
FROM 340
K6
VIDEO CONTROL
AV340 0340
BUFFER
ONESHOT
7550-A TSH93
7550-B TSH93
7550-C TSH93
7570-A 74HCT4053D
7570-B 74HCT4053D
7570-C 74HCT4053D
7575-A 74HCT14D
7575-B 74HCT14D
7545-A 74HCT4538
7460-D 74HCT125D
7460-C 74HCT125D
F521 2V / div DC 20µs / div
F529 2V / div DC 20µs / div
F560 1V / div DC 20µs / div
F578 2V / div DC 20µs / div
F525 2V / div DC 20µs / div
F559 1V / div DC 20µs / div
F561 1V / div DC 20µs / div
F579 2V / div DC 5ms / div
F580 2V / div DC 20µs / div
AV303 0303
MONITOR OUTPUT CONNECTOR
15P MINI "D" SHELL
AV355 0355
TO 0355
K7
TXT & CONTROL
TO VIDEO+RC
AV7
FROM/TO CONTROL
AV8
HFB GENERATOR
FROM 0307
P5
SUPPLY
AV307 0307
AV310 0310
TO 0310
K1
TUNER-IF
AV306 0306
FROM 0306
P5
SUPPLY
AV315 0315
FROM 0315
K6
VIDEO CONTROL
CON. JUMPERS 1519 FTV 1.9 FTV 2.3
EXPLANATION CON. JUMPERS 1519 FTV 1.9 FM 23
3122 123 60092
CL 26532118_005.eps
221002

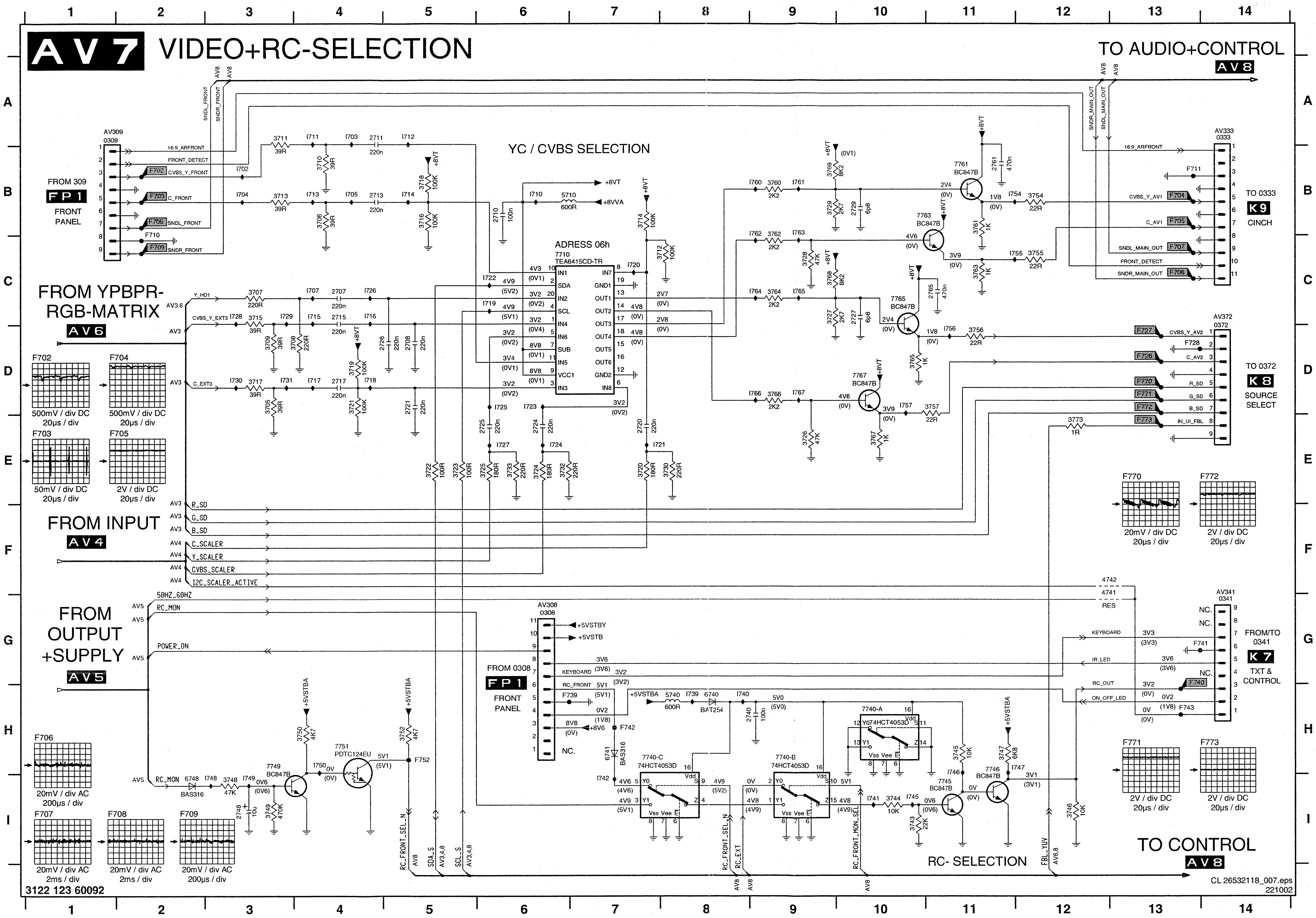
0303	B14
0306	H2
0307	G4
0310	G6
0315	H10
0340	A1
0355	F14
1512	G8
1513	H7
1519	C11
2510	I7
2511	I8
2512	G8
2513	H7
2514	I8
2515	H8
2519	D8
2520	D8
2521	A5
2522	B2
2523	B5
2524	B2
2525	B5
2526	B3
2527	B5
2528	B2
2529	B5
2530	B2
2531	C5
2532	B3
2534	C2
2536	C2
2538	C3
2542	H2
2545	E10
2546	F11
2550	A10
2551	A10
2570	D4
2571	G11
2575	D6
2585	I11
2587	I11
2588	I12
3510	I7
3511	I7
3512	I7
3519	F8
3520	A8
3521	A2
3522	C4
3523	B3
3525	B2
3526	C4
3527	B3
3529	B2
3530	C4
3531	C3
3533	B8
3534	B8
3535	C8
3536	A4
3537	A4
3538	A4
3539	F11
3540	G1
3541	G1
3542	G2
3543	G1
3544	H3
3545	E11
3546	F11
3547	F5
3548	F5
3550	B9
3551	C9
3552	C9
3553	A9
3554	B9
3555	C9
3556	B10
3557	C10
3558	C10
3559	B11
3560	B11
3561	B11
3562	A9
3563	B9
3564	C9
3565	A10
3566	B10
3567	C10
3568	F7
3569	G13
3570	G11
3571	E5
3572	F5
3573	D2
3574	D3
3575	D3
3576	G11
3577	G13
3578	E8
3579	E9
3580	E9
3581	I12
3582	E11
3583	F11
3584	H11
3585	I11
3586	I11
3587	I12
3588	I12
3589	I13
3590	F7
3591	E9
3592	F9
3593	I12
3594	H11
3595	F12
3596	E13
3597	F13
3598	F13
3599	I5
4519	D12
4520	E12
4521	E12
5513	H8
5520	D8
5523	A2
5525	A3
5529	B2
5531	B3
5535	B2
5537	B3
5545	E9
5550	A10
5570	D4
5575	D5
5585	H10
6513	H8
6559	C11
6560	C11
6561	C11
6570	D3
6571	F11
6578	D9
6579	D9
6580	D9
6581	D13
6582	D13
6583	D13
6584	C13
6595	E11
7460-C	F12
7460-D	E12
7520	A5
7540	G1
7545-A	E10
7546	F6
7550-A	A9
7550-B	B9
7550-C	C9
7568	F6
7570-A	D3
7570-B	F2
7570-C	E3
7571	G12
7573	D3
7575-A	D6
7575-B	D7
7575-C	E6
7575-D	E7
7575-E	E5
7575-F	E6
7587	I11
7589	I12
F501	H2
F502	H2
F503	H2
F504	I2
F505	I2
F506	G5
F507	H5
F508	H7
F509	H5
F510	I8
F511	I8
F512	G8
F513	I8
F514	H7
F515	H9
F516	H5
F518	F11
F519	D11
F520	A1
F521	B1
F522	A5
F523	B5
F524	B5
F525	B1
F526	B5
F528	C5
F529	B1
F530	C5
F533	A8
F534	G3
F548	F11
F559	B13
F560	B13
F561	B13
F562	C13
F576	C14
F577	D14
F578	D13
F579	D13
F580	C13
F581	F9
F582	F13
F583	F13
F584	I10
F585	I11
F591	D14
F592	E11
F595	B13
F596	I5
F597	I5
F598	I5
F599	I6
I510	H7
I511	H8
I512	I8
I513	I8
I514	H8
I520	D8
I521	A4
I523	B4
I525	B4
I527	B4
I529	B4
I531	C4
I532	C8
I533	A8
I534	B8
I535	A2
I536	A2
I537	B2
I538	B2
I539	B2
I540	B2
I541	G2
I542	G1
I543	F5
I544	F5
I545	E10
I546	E10
I547	F10
I549	F9
I550	A10
I551	G11
I552	A9
I553	B9
I554	B9
I555	C9
I556	A10
I557	B10
I558	C10
I559	B10
I560	B11
I561	B10
I562	A9
I563	B9
I564	C9
I565	B11
I566	B10
I567	B11
I568	D9
I569	D9
I570	D4
I571	E5
I572	F5
I573	D3
I574	D3
I575	D7
I576	E7
I577	E7
I578	E8
I579	E8
I580	D4
I581	F6
I582	F7
I584	H10
I585	H12
I586	I11
I587	I12
I588	I12
I589	I13
I590	F11
I591	F9
I592	E8
I593	F8
I594	G12
I595	G12
I596	E12
I597	F12
I598	F13
I599	E12

AV Interface Panel: YPBPR RGB Matrix


AV6
YPBPR-RGB-MATRIX
YPBPR TO RGB MATRIX
HD1 INPUT
FROM 0304
SD1
SD-CONNECTOR PANEL EUROPE
OR
FROM 0304
HD
HD-CONNECTOR PANEL USA-AP
AV304 0304
Y_SD
PB_SD
PR_SD
CVBS_Y_EXT3
C_EXT3
7635 BC847B
7603 BC847B
7643 BC847B
7623 BC847B
7607-A TSH93
7607-B TSH93
7607-C TSH93
7610-A 74HC4053D
7610-B 74HC4053D
7610-C 74HC4053D
7615 PDTC124EU
FROM AUDIO+CONTROL
AV8
TO VIDEO+RC
AV7
USA ONLY
TO HD-MATRIX
AV2
HD1-HD2-SELECTION
7670 TDA8601T
DECODING
SELECTABLE CLAMP
3-STATE
HD2 INPUT
FROM/TO 0300
HD
HD CONNECTOR PANEL
AV300 0300
H_HD_EXT
V_HD_EXT
G_Y_HD
B_Pb_HD
R_Pr_HD
7690 PDTC124EU
7691 PDTC124EU
AV3
TO HD-SYNC-PROCESSING
F601
500mV / div DC
20µs / div
F621
500mV / div DC
20µs / div
F641
2V / div DC
5ms / div
3122 123 60092
CL 26532118_006.eps
221002

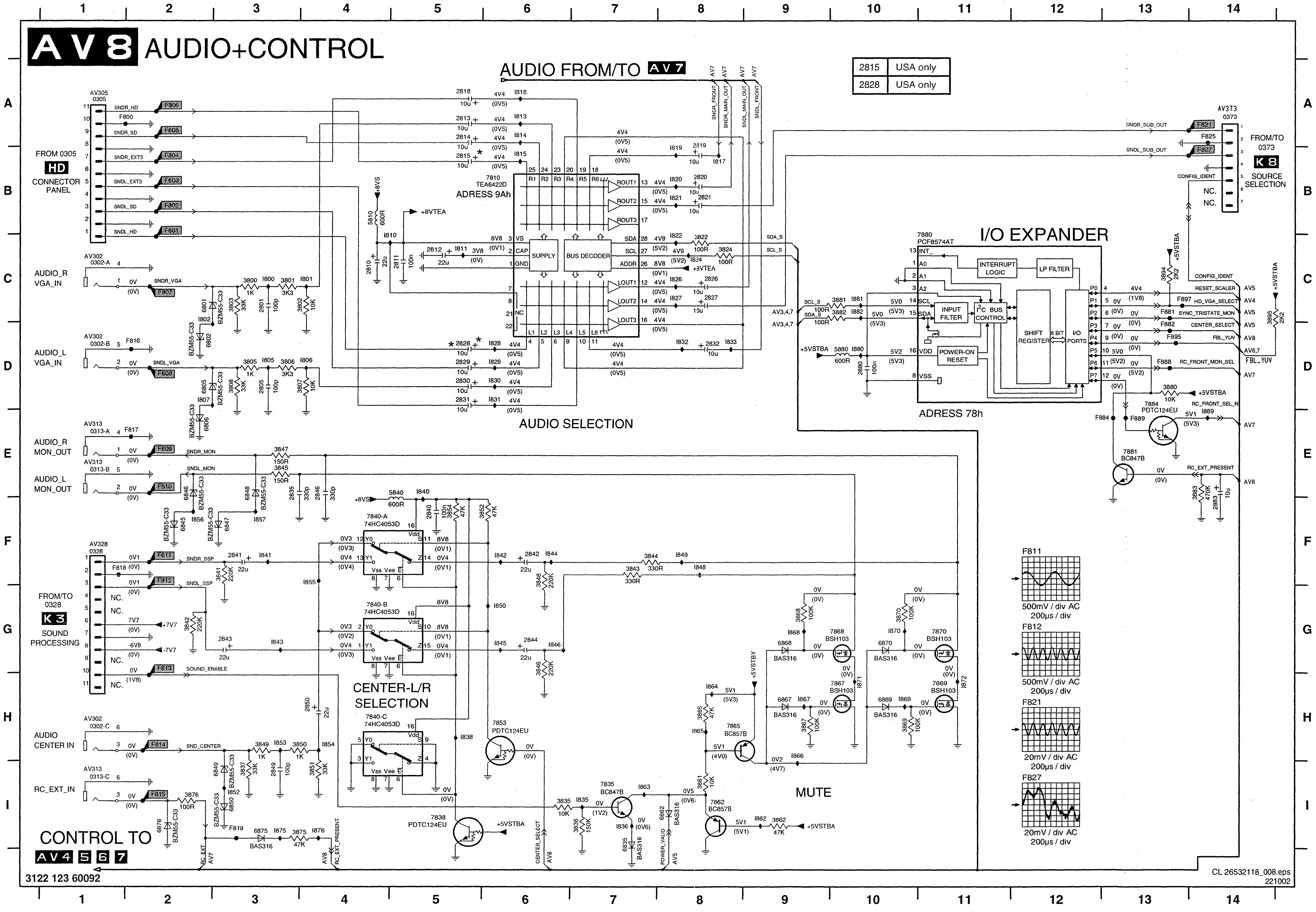
0300	G1
0304	B1
2601	A6
2607	A9
2608	B9
2610	A10
2622	D6
2628	C9
2642	C6
2648	E9
2655	A1
2656	A2
2657	H3
2665	B3
2666	B4
2670	I9
2671	G6
2673	G6
2675	G6
2677	G6
2679	H6
2681	H6
3602	A6
3603	A6
3605	B7
3606	A8
3608	B9
3609	A8
3610	B8
3611	A11
3615	A12
3622	D6
3623	D6
3625	D7
3626	C9
3627	C8
3628	C9
3629	B8
3630	B8
3631	C8
3635	C2
3636	D4
3637	D3
3638	D4
3642	C6
3643	B6
3645	C7
3648	D9
3649	D8
3650	D8
3651	D8
3655	H3
3656	I3
3657	H3
3666	A2
3671	G5
3673	G5
3675	G5
3677	G5
3679	H5
3681	H5
3683	G9
3684	F9
3685	G9
3686	F9
3687	H9
3688	F9
3690	I6
3691	F11
5610	A10
5655	A1
5670	I9
6666	A3
6667	B3
6670	I2
6679	I2
7603	A7
7607-A	A9
7607-B	B9
7607-C	D9
7610-A	B10
7610-B	A10
7610-C	D10
7615	A12
7623	D7
7635	C3
7643	C7
7670	F6
7690	I5
7691	F11
F601	B2
F603	B2
F621	B2
F635	C2
F641	C2
F655	A2
F660	C2
F661	C2
F666	A3
F667	A4
F670	G2
F671	G2
F673	G2
F676	H2
F679	G2
F680	H2
F690	I5
F691	E11
I602	A6
I603	A7
I604	A6
I607	A9
I608	A9
I610	A10
I611	B8
I615	A12
I621	D6
I622	D6
I623	D7
I626	B8
I627	C9
I631	C8
I635	C3
I636	D4
I641	C6
I642	C6
I643	C7
I646	D8
I647	D9
I651	D8
I655	H3
I656	H3
I670	I9
I671	G6
I672	G6
I673	G6
I674	G6
I675	G6
I676	G6
I677	G6
I678	G6
I679	H6
I680	H6
I681	H6
I682	H6
I683	G9
I685	F9
I687	G9

AV Interface Panel: Video + RC Selection


AV7
VIDEO+RC-SELECTION
TO AUDIO+CONTROL
AV8
YC / CVBS SELECTION
FROM 309
FP1
FRONT PANEL
AV309
0309
16:9_ARFRONT
FRONT_DETECT
CVBS_Y_FRONT
C_FRONT
SNDL_FRONT
SNDR_FRONT
F702
F703
F706
F709
F710
FROM YPBPR-RGB-MATRIX
AV6
Y_HD1
CVBS_Y_EXT3
C_EXT3
ADRESS 06h
7710
TEA6415CD-TR
IN1
SDA
IN2
SCL
IN4
IN6
SUB
IN5
VCC1
IN3
IN7
GND1
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
GND2
IN8
+8VT
+8VVA
5710
600R
7761
BC847B
7763
BC847B
7765
BC847B
7767
BC847B
AV333
0333
TO 0333
K9
CINCH
CVBS_Y_AV1
C_AV1
SNDL_MAIN_OUT
FRONT_DETECT
SNDR_MAIN_OUT
F704
F705
F707
F708
F711
AV372
0372
TO 0372
K8
SOURCE SELECT
CVBS_Y_AV2
C_AV2
R_SD
G_SD
B_SD
IN_UI_FBL
F726
F727
F728
F770
F771
F772
F773
F702
F704
500mV / div DC
20µs / div
500mV / div DC
20µs / div
F703
F705
50mV / div DC
20µs / div
2V / div DC
20µs / div
FROM INPUT
AV4
AV3
R_SD
G_SD
B_SD
C_SCALER
Y_SCALER
CVBS_SCALER
I2C_SCALER_ACTIVE
F770
F772
20mV / div DC
20µs / div
2V / div DC
20µs / div
FROM OUTPUT +SUPPLY
AV5
50HZ_60HZ
RC_MON
POWER_ON
4742
4741
RES
AV308
0308
+5VSTBY
+5VSTB
FROM 0308
FP1
FRONT PANEL
KEYBOARD
RC_FRONT
F739
F742
+5VSTBA
5740
600R
6740
BAT254
2740
100n
7740-A
74HCT4053D
7740-B
74HCT4053D
7740-C
74HCT4053D
6741
BAS316
AV341
0341
FROM/TO 0341
K7
TXT & CONTROL
KEYBOARD
IR_LED
RC_OUT
ON_OFF_LED
F740
F741
F743
NC.
F706
20mV / div AC
200µs / div
7749
BC847B
7751
PDTC124EU
6748
BAS316
3748
47K
3750
4K7
3752
4K7
F752
7745
BC847B
7746
BC847B
3745
10K
3747
6K8
3746
10K
3743
22K
3744
10K
F771
F773
2V / div DC
20µs / div
2V / div DC
20µs / div
F707
F708
F709
20mV / div AC
2ms / div
20mV / div AC
2ms / div
20mV / div AC
200µs / div
RC_FRONT_SEL_N
SDA_S
SCL_S
RC_EXT
RC_FRONT_MON_SEL
FBL_YUV
RC- SELECTION
TO CONTROL
AV8
3122 123 60092
CL 26532118_007.eps
221002
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I

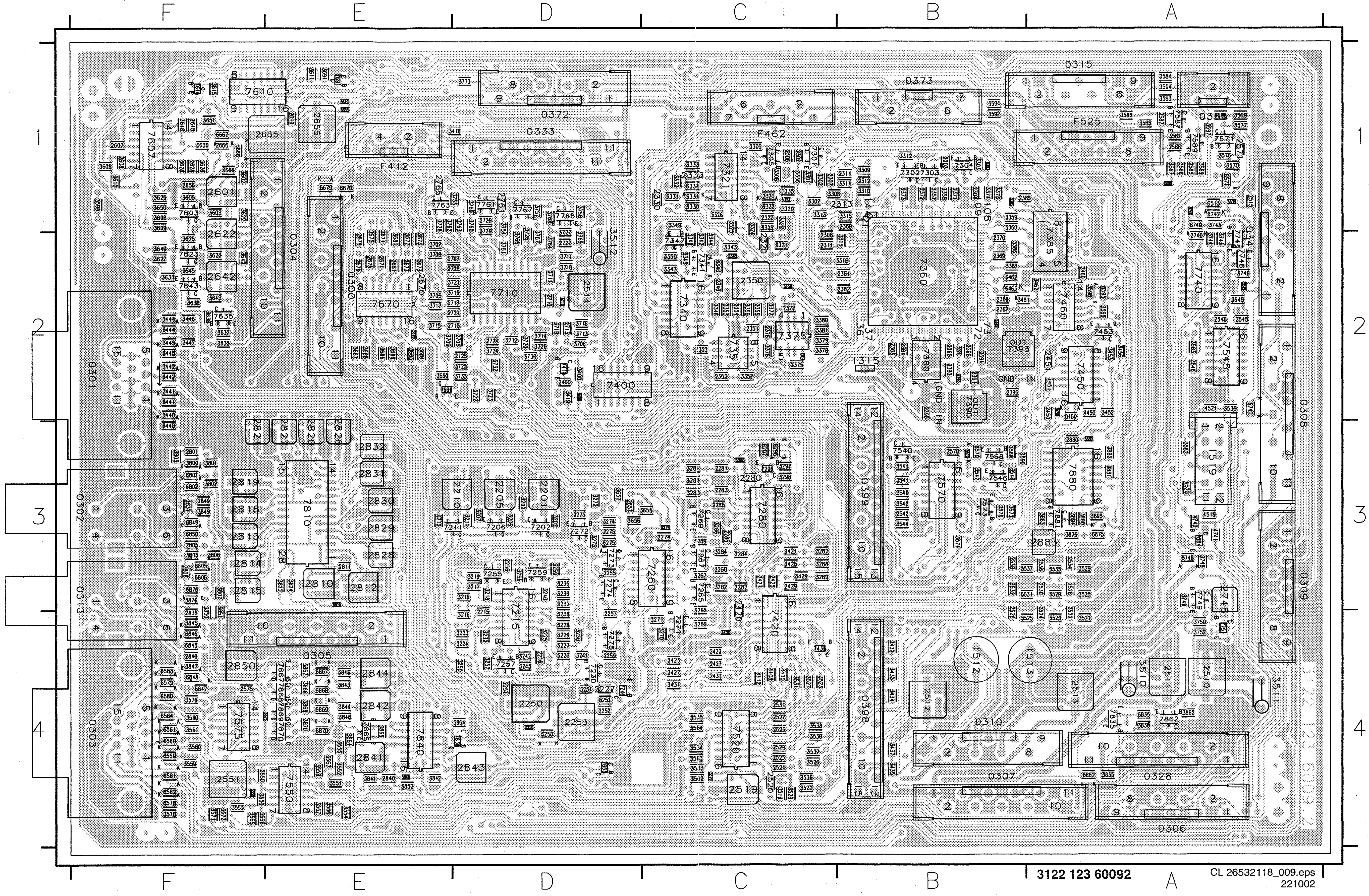
0308	G6
0309	A1
0333	A14
0341	G14
0372	D14
2707	C4
2708	D5
2710	B6
2711	A4
2713	B4
2715	C4
2717	D4
2720	E7
2721	D5
2724	E6
2725	E6
2726	D5
2727	C10
2729	B10
2740	H9
2748	I3
2761	B11
2765	C11
3705	D3
3706	B4
3707	C3
3708	D4
3709	D3
3710	B4
3711	A3
3712	C8
3713	B3
3714	B7
3715	C3
3716	B5
3717	D3
3718	B5
3719	D4
3720	E7
3721	D4
3722	E5
3723	E5
3724	E6
3725	E6
3726	E9
3727	C9
3728	C9
3729	B9
3730	E8
3732	E6
3733	E6
3743	I10
3744	I10
3745	H11
3746	I12
3747	H11
3748	I3
3749	I3
3750	H4
3752	H5
3754	B12
3755	C12
3756	D11
3757	D11
3760	B9
3761	B11
3762	C9
3763	C11
3764	C9
3765	D10
3766	D9
3767	E10
3768	C9
3769	B9
3773	E12
4741	F12
4742	F12
5710	B6
5740	H8
6740	H8
6741	H7
6748	I2
7710	C6
7740-A	H10
7740-B	H9
7740-C	H7
7745	I11
7746	H11
7749	H3
7751	H4
7761	B11
7763	B10
7765	C10
7767	D10
F702	B2
F703	B2
F704	B13
F705	B13
F706	B2
F707	C13
F708	C13
F709	C2
F710	C2
F711	B13
F726	D13
F727	D13
F728	D13
F739	H6
F740	G13
F741	G13
F742	H7
F743	H13
F752	H5
F770	D13
F771	D13
F772	D13
F773	E13
I702	B3
I703	A4
I704	B3
I705	B4
I707	C4
I710	B6
I711	A4
I712	A5
I713	B4
I714	B5
I715	C4
I716	C4
I717	D4
I718	D4
I719	C6
I720	C7
I721	E7
I722	C6
I723	D6
I724	E6
I725	D6
I726	C4
I727	E6
I728	C3
I729	C3
I730	D3
I731	D3
I739	H8
I740	H8
I741	I10
I742	I7
I745	I10
I746	H11
I747	H12
I748	I3
I749	I3
I750	H4
I754	B11
I755	C12
I756	D11
I757	D10
I760	B9
I761	B9
I762	B9
I763	B9
I764	C9
I765	C9
I766	D9
I767	D9

AV Interface Panel: Audio + Control


AV8 AUDIO+CONTROL
AUDIO FROM/TO AV7
2815 USA only
2828 USA only
FROM 0305
HD
CONNECTOR PANEL
AV305 0305
SNDR_HD
SNDR_SD
SNDR_EXT3
SNDL_EXT3
SNDL_SD
SNDL_HD
F800
F801
F802
F803
F804
F805
F806
AUDIO_R VGA_IN
AUDIO_L VGA_IN
AV302 0302-A
AV302 0302-B
SNDR_VGA
SNDL_VGA
F807
F808
F816
AUDIO_R MON_OUT
AUDIO_L MON_OUT
AV313 0313-A
AV313 0313-B
SNDR_MON
SNDL_MON
F809
F810
F817
FROM/TO 0328
K3
SOUND PROCESSING
AV328 0328
SNDR_SSP
SNDL_SSP
SOUND_ENABLE
F811
F812
F813
F818
NC.
+7V7
-7V7
AUDIO CENTER IN
AV302 0302-C
SND_CENTER
F814
RC_EXT_IN
AV313 0313-C
F815
F819
CONTROL TO
AV4 5 6 7
3122 123 60092
7810 TEA6422D ADRESS 9Ah
SUPPLY
BUS DECODER
ROUT1
ROUT2
ROUT3
LOUT1
LOUT2
LOUT3
SDA
SCL
ADDR
CAP
GND
VS
+8VTEA
+3VTEA
+8VS
AUDIO SELECTION
SNDR_FRONT
SNDR_MAIN_OUT
SNDL_MAIN_OUT
SNDL_FRONT
SDA_S
SCL_S
AV3,4,7
7840-A 74HC4053D
7840-B 74HC4053D
7840-C 74HC4053D
CENTER-L/R SELECTION
7853 PDTC124EU
7838 PDTC124EU
7835 BC847B
7862 BC857B
7865 BC857B
7867 BSH103
7868 BSH103
7869 BSH103
7870 BSH103
BAS316
+5VSTBY
+5VSTBA
MUTE
RC_EXT
RC_EXT_PRESENT
CENTER_SELECT
POWER_VALID
7880 PCF8574AT
I/O EXPANDER
INTERRUPT LOGIC
LP FILTER
INPUT FILTER
I²C BUS CONTROL
SHIFT REGISTER
8 BIT
I/O PORTS
POWER-ON RESET
ADRESS 78h
AV373 0373
FROM/TO 0373
K8
SOURCE SELECTION
SNDR_SUB_OUT
SNDL_SUB_OUT
CONFIG_IDENT
F821
F825
F827
RESET_SCALER
HD_VGA_SELECT
SYNC_TRISTATE_MON
CENTER_SELECT
FBL_YUV
RC_FRONT_MON_SEL
RC_FRONT_SEL_N
RC_EXT_PRESENT
7884 PDTC124EU
7881 BC847B
F811
500mV / div AC
200µs / div
F812
500mV / div AC
200µs / div
F821
20mV / div AC
200µs / div
F827
20mV / div AC
200µs / div
CL 26532118_008.eps
221002

0302-A	C1
0302-B	D1
0302-C	H1
0305	A1
0313-A	E1
0313-B	E1
0313-C	I1
0328	F1
0373	A14
2801	C3
2805	D3
2810	C4
2811	C5
2812	C5
2813	A5
2814	A5
2815	B5
2818	A5
2819	B8
2820	B8
2821	B8
2826	C8
2827	C8
2828	D5
2829	D5
2830	D5
2831	D5
2832	D8
2835	E3
2840	F5
2841	F3
2842	F6
2843	G3
2844	G6
2846	E4
2849	I3
2850	H4
2880	D10
2883	F14
3800	C3
3801	C3
3802	C4
3803	C3
3805	D3
3806	D3
3807	D4
3808	D3
3822	C8
3824	C8
3835	I6
3836	I7
3837	I3
3841	F3
3842	G2
3843	F7
3844	F7
3845	E3
3846	G6
3847	E3
3848	F6
3849	H3
3850	H4
3851	I4
3852	F6
3854	F5
3861	I8
3862	I9
3865	H8
3867	H9
3868	G9
3869	H10
3870	G10
3875	I4
3876	I2
3880	D13
3881	C10
3882	C10
3883	E14
3894	C13
3895	C14
5810	B4
5840	E5
5880	D10
6801	C2
6802	D2
6805	D2
6806	E2
6835	I7
6845	F2
6846	E2
6847	F3
6848	E3
6849	I3
6850	I3
6862	I8
6867	H9
6868	G9
6869	H10
6870	G10
6875	I3
6876	I2
7810	B6
7835	I7
7838	I5
7840-A	F4
7840-B	G4
7840-C	H4
7853	H6
7862	I8
7865	H8
7867	H10
7868	G10
7869	H11
7870	G11
7880	C10
7881	E13
7884	D13
F800	A2
F801	B2
F802	B2
F803	B2
F804	B2
F805	A2
F806	A2
F807	C2
F808	D2
F809	E2
F810	E2
F811	F2
F812	F2
F813	G2
F814	H2
F815	I2
F816	D2
F817	E2
F818	F1
F819	I3
F821	A14
F825	A14
F827	B14
F881	C13
F882	D13
F884	E13
F888	D13
F889	E13
F895	D13
F897	C13
I800	C3
I801	C4
I802	C2
I805	D3
I806	D4
I807	D2
I810	C4
I811	C5
I813	A6
I814	A6
I815	B6
I817	B8
I818	A6
I819	B8
I820	B8
I821	B8
I822	C8
I824	C8
I826	C8
I827	C8
I828	D6
I829	D6
I830	D6
I831	D6
I832	D8
I833	D8
I835	I7
I836	I7
I838	H5
I840	E5
I841	F3
I842	F6
I843	G3
I844	F6
I845	G6
I846	G6
I848	F8
I849	F8
I850	G6
I852	I3
I853	H3
I854	H4
I855	F4
I856	F2
I857	F3
I862	I9
I863	I7
I864	H8
I865	H8
I866	H9
I867	H9
I868	G9
I869	H10
I870	G10
I871	H10
I872	H11
I875	I3
I876	I4
I880	D10
I881	C10
I882	C10
I889	E14

Layout AVI Panel (Top Side)


F
E
D
C
B
A
1
2
3
4
0372
0333
F412
F462
0373
0315
F525
0304
0300
7610
7607
7670
7710
7400
7321
7340
7331
7375
7360
7385
7460
7380
7393
7390
7450
7740
7545
0308
1519
0309
1315
0301
0302
0313
0303
7810
0305
7575
7550
7840
2850
2844
2842
2841
2843
2551
2210
2205
2201
7215
7260
7280
7420
7520
2250
2253
2519
0399
0398
7570
7880
2883
1512
1513
2512
2513
2511
2510
2748
0310
0307
0328
0306
3510
3511
3512
2350
2665
2655
2601
2622
2642
2514
2832
2831
2830
2829
2828
2819
2818
2813
2814
2815
2810
2812
3122 123 60092

CL 26532118_009.eps
221002

Mapping Layout AVI Panel

Mapping Top Side

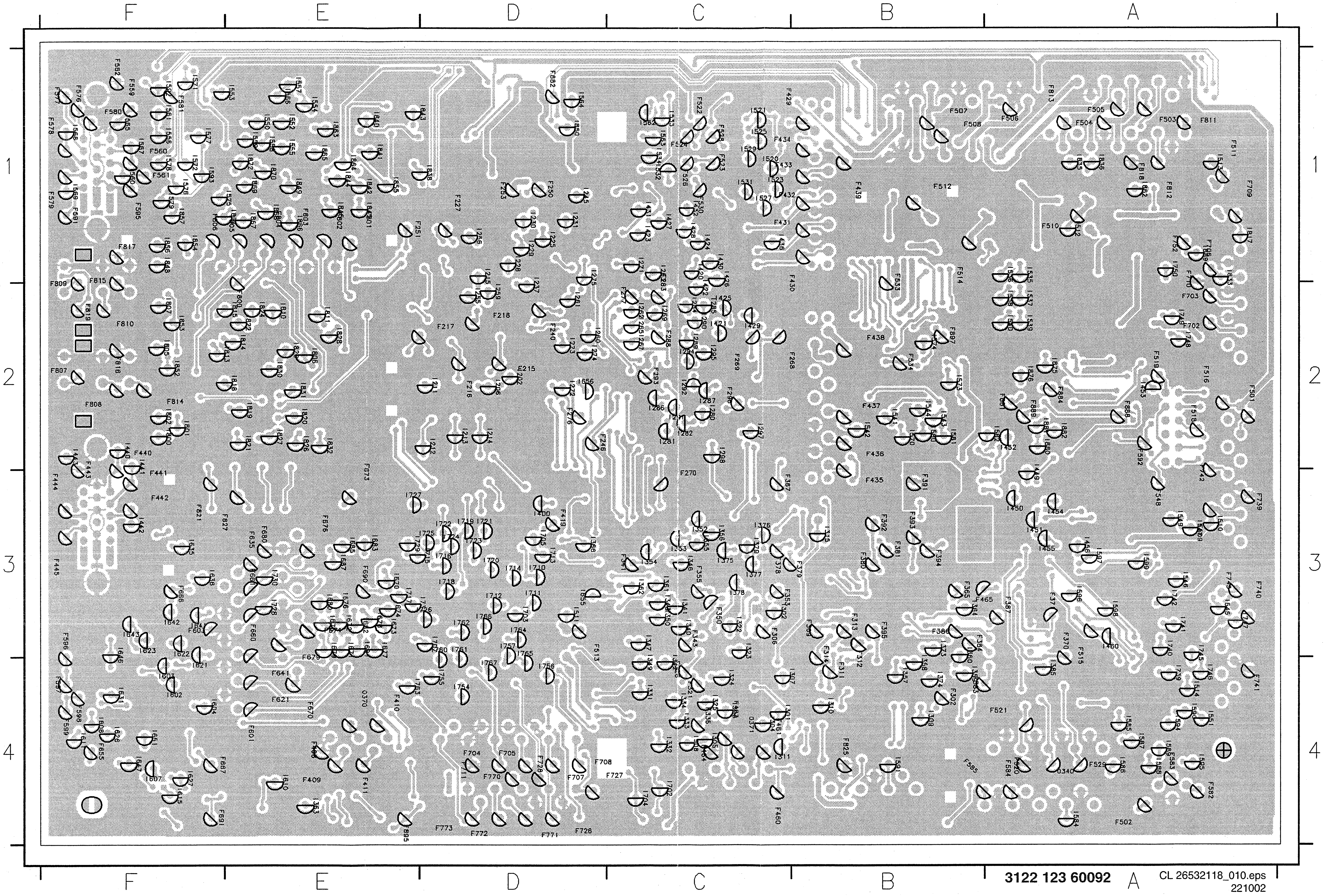
0300	E2
0301	F2
0302	F3
0303	F4
0304	E2
0305	E4
0306	A4
0307	B4
0308	A2
0309	A3
0310	B4
0313	F3
0315	A1
0328	A4
0333	D1
0340	A1
0341	A2
0355	A1
0370	E1
0371	C1
0372	D1
0373	B1
0398	B4
0399	B3
1315	C1
1340	C2
1341	C2
1342	C2
1512	B4
1513	A4
1519	A3
2201	D3
2205	D3
2210	D3
2215	D4
2227	D4
2250	D4
2251	D4
2252	D4
2253	D4
2255	D3
2257	D4
2259	D4
2260	C3
2274	C3
2275	D3
2280	C3
2281	C3
2282	C3
2283	C3
2284	C3
2285	C3
2286	C3
2303	B1
2304	B1
2307	C1
2311	C2
2312	B1
2313	C1
2320	C1
2321	C1
2322	C1
2330	C1
2333	C1
2340	C2
2350	C2
2351	C2
2352	C2
2353	C2
2360	B1
2361	B2
2362	B2
2363	B2
2364	B2
2365	B2
2366	B2
2367	B2
2368	B2
2369	B2
2370	B2
2371	B1
2372	B1
2373	B1
2375	C2
2376	C2
2377	C2
2380	B2
2385	B1
2390	B2
2391	B2
2393	B2
2394	B2
2400	D2
2420	C4
2421	C3
2423	C4
2425	C3
2427	C4
2429	C3
2431	C4
2450	A2
2451	A2
2460	A2
2510	A4
2511	A4
2512	B4
2513	A4
2514	D2
2515	A1
2520	C4
2521	C4
2522	A4
2523	C4
2524	A4
2525	C4
2526	B4
2527	C4
2528	A3
2529	C4
2530	A3
2531	C4
2532	B3
2534	A3
2536	A3
2538	B3
2542	B3
2545	A2
2546	A2
2550	F4
2551	F4
2570	B3
2571	A1
2575	F4
2585	A1
2587	A1
2588	A1
2601	F1
2607	F1
2608	F1
2610	E1
2622	F2
2628	F1
2642	F2
2648	F1
2655	E1
2656	F1
2657	D3
2665	E1
2666	F1
2670	E2
2671	E2
2673	E2
2675	E2
2677	E2
2679	E2
2681	E2
2707	D2
2708	D2
2710	D2
2711	D2
2713	D2
2715	D2
2717	D2
2720	D2
2721	D2
2724	D2
2725	D2
2726	D2
2727	D2
2729	D1
2740	A2
2748	A3
2765	E1
2801	F3
2805	F3
2810	E3
2811	E3
2812	E3
2813	F3
2814	F3
2815	F3
2818	F3
2819	F3
2820	E3
2821	F3
2826	E3
2827	E3
2828	E3
2829	E3
2830	E3
2831	E3
2832	E3
2835	F4
2840	E4
2841	E4
2842	E4
2843	D4
2844	E4
2846	F4
2849	F3
2850	F4
2880	A3
2883	A3
3201	D3
3202	D3
3203	D3
3205	D3
3206	D3
3207	D3
3210	E3
3211	D3
3212	E3
3215	D3
3216	D4
3217	D3
3218	D3
3223	D4
3224	D4
3225	D4
3226	D4
3227	D4
3228	D4
3229	D4
3230	D4
3231	D4
3232	D4
3237	D3
3238	D4
3239	D3
3240	D3
3241	D4
3242	D4
3250	D4
3255	D3
3257	D4
3259	D3
3260	C4
3265	C4
3267	C3
3269	C3
3270	C4
3271	C4
3272	D3
3273	D3
3274	D3
3275	D3
3281	C3
3282	C3
3283	C3
3284	C3
3285	C3
3286	C3
3287	C3
3288	C3
3289	C3
3296	C3
3297	C3
3301	C1
3303	B1
3304	B1
3305	C1
3307	C1
3308	C1
3309	B1
3310	B1
3311	B2
3312	C1
3313	C1
3314	B1
3315	B1
3320	C1
3321	C1
3322	C1
3323	C1
3324	C1
3325	C1
3326	C1
3330	C1
3331	C1
3332	C1
3333	C1
3334	C1
3335	C1
3336	C1
3342	C2
3343	C2
3344	C2
3345	C2
3346	C2
3347	C2
3352	C2
3353	C2
3354	C2
3355	C2
3356	C2
3357	B1
3358	B1
3359	B1
3360	B1
3376	C2
3377	C2
3378	C2
3379	C2
3380	C2
3381	C2
3386	B2
3387	B2
3400	D2
3410	D1
3419	D2
3421	C3
3423	C4
3425	C3
3427	C4
3429	C3
3431	C4
3432	B4
3433	B4
3434	B4
3435	B4
3437	B4
3440	F2
3441	F2
3442	F2
3444	F2
3445	F2
3446	F2
3447	F2
3452	A2
3453	A2
3461	B2
3462	A2
3510	A4
3511	A4
3512	D2
3519	C4
3520	C4
3521	A4
3522	C4
3523	C4
3525	A3
3526	C4
3527	C4
3529	A3
3530	C4
3531	C4
3533	C4
3534	C4
3535	C4
3536	C4
3537	C4
3538	C4
3539	A2
3540	B3
3541	B3
3542	B3
3543	B3
3544	B3
3545	A2
3546	A2
3547	B3
3548	B3
3550	F4
3551	E4
3552	E4
3553	F4
3554	E4
3555	E4
3556	F4
3557	E4
3558	E4
3559	F4
3560	F4
3561	F4
3562	C4
3563	C4
3564	C4
3565	F4
3566	E4
3567	E4
3569	A1
3570	A1
3571	F4
3572	F4
3573	B3
3574	B3
3575	B3
3576	A1
3577	A1
3578	F4
3579	F4
3580	F4
3581	A1
3582	A3
3583	A2
3584	A1
3585	A1
3586	A1
3587	A1
3588	A1
3589	A1
3591	B1
3592	B1
3593	A1
3594	A1
3595	A2
3596	A2
3597	A1
3598	A1
3599	F1
3602	F1
3603	F1
3605	F1
3606	F1
3608	F1
3609	F1
3610	F1
3611	E1
3615	F1
3622	F1
3623	F2
3625	F2
3626	F1
3627	F2
3628	F1
3629	F1
3630	F1
3631	F2
3635	F2
3636	F2
3637	F2
3638	F2
3642	F2
3643	F2
3645	F2
3648	F1
3649	F2
3650	F1
3651	F1
3655	C3
3656	D3
3657	D3
3666	F1
3671	E2
3673	E2
3675	E2
3677	E2
3679	E2
3681	E2
3683	E2
3684	E2
3685	E2
3686	E2
3687	E2
3688	E2
3690	E2
3691	E1
3705	E2
3706	D2
3707	E2
3708	E2
3709	E2
3710	D2
3711	D2
3712	D2
3713	D2
3714	D2
3715	E2
3716	D2
3717	E2
3718	D2
3719	D2
3720	D2
3721	D2
3722	D2
3723	D2
3724	D2
3725	D2
3726	D1
3727	D2
3728	E1
3729	D1
3730	D2
3732	D2
3733	D2
3743	A2
3744	A2
3745	A1
3746	A2
3747	A1
3748	A3
3749	A3
3750	A4
3752	A4
3754	D1
3755	D1
3756	D1
3757	D1
3760	D1
3761	D2
3762	E1
3763	D1
3764	D2
3765	D2
3766	D2
3767	D2
3768	D1
3769	D1
3773	D1
3800	F3
3801	F3
3802	F3
3803	F3
3805	F3
3806	F3
3807	F3
3808	F3
3822	E3
3824	E3
3835	A4
3836	A4
3837	F3
3841	E4
3842	E4
3843	E4
3844	E4
3845	F4
3846	E4
3847	F4
3848	E4
3849	F3
3850	F4
3851	F4
3852	E4
3854	D4
3861	E4
3862	A4
3865	E4
3867	E4
3868	E4
3869	E4
3870	E4
3875	A3
3876	F3
3880	A3
3881	A3
3882	A3
3883	A3
3894	A3
3895	A3
4408	C4
4410	C4
4412	C4
4450	A2
4451	A2
4519	A3
4520	A3
4521	A2
4741	A3
4742	A3
5250	D4
5274	C3
5280	C3
5303	B1
5321	C1
5340	C2
5350	C2
5385	B1
5400	D2
5420	C4
5450	A2
5513	A1
5520	C4
5523	A4
5525	A4
5529	A3
5531	A3
5535	A3
5537	A3
5545	A2
5550	F4
5570	B3
5575	E4
5585	A1
5610	E1
5655	E1
5670	E2
5710	D2
5740	A1
5810	E3
5840	E4
5880	A3
6250	D4
6251	D4
6275	D4
6296	C3
6297	C3
6322	C1
6334	C1
6340	C2
6440	F3
6441	F2
6442	F2
6444	F2
6445	F2
6450	A2
6462	B2
6463	B2
6513	A1
6559	F4
6560	F4
6561	F4
6570	B3
6571	A1
6578	F4
6579	F4
6580	F4
6581	F4
6582	F4
6583	F4
6584	F4
6595	A2
6666	F1
6667	F1
6670	E1
6679	E1
6740	A1
6741	A2
6748	A3
6801	F3
6802	F3
6805	F3
6806	F3
6835	A4
6845	F4
6846	F4
6847	F4
6848	F4
6849	F3
6850	F3
6862	A4
6867	E4
6868	E4
6869	E4
6870	E4
6875	A3
6876	F3
7202	D3
7206	D3
7211	D3
7215	D4
7230	D4
7246	D4
7255	D3
7257	D4
7259	D3
7260	C3
7265	C3
7267	C3
7269	C3
7271	C4
7272	D3
7273	D3
7274	D3
7275	D4
7280	C3
7296	C3
7301	C1
7302	B1
7303	B1
7304	B1
7305	C1
7321	C1
7340	C2
7341	C2
7347	C2
7351	C2
7360	B2
7375	C2
7380	B2
7385	A2
7390	B2
7393	B2
7400	D2
7419	D2
7420	C4
7435	C4
7450	A2
7453	A2
7460	A2
7520	C4
7540	B3
7545	A2
7546	B3
7550	E4
7568	B3
7570	B3
7571	A1
7573	B3
7575	F4
7587	A1
7589	A1
7603	F1
7607	F1
7610	F1
7615	F1
7623	F2
7635	F2
7643	F2
7670	E2
7690	E2
7691	E1
7710	D2
7740	A2
7745	A2
7746	A2
7749	A3
7751	A4
7761	D1
7763	E1
7765	D1
7767	D1
7810	E3
7835	A4
7838	D4
7840	E4
7853	D4
7862	A4
7865	E4
7867	E4
7868	E4
7869	E4
7870	E4
7880	A3
7881	A3
7884	A3

Mapping Bottom Side

F204	D3
F205	D3
F206	D3
F208	D3
F209	D3
F210	D2
F215	D2
F216	D2
F217	E2
F218	D1
F222	D1
F227	D2
F232	D1
F236	D2
F240	D1
F250	D1
F251	D2
F253	D1
F255	C2
F268	C2
F269	C1
F270	C1
F302	B4
F306	C3
F309	B3
F311	B4
F312	B3
F313	B3
F314	B3
F321	C4
F326	C3
F336	C4
F341	C3
F343	C3
F350	C3
F353	B3
F355	B3
F370	B4
F371	B3
F380	B3
F381	B3
F391	B3
F394	B3
F408	E4
F409	E4
F410	E4
F411	E4
F412	E4
F429	B1
F430	C2
F431	C1
F432	C1
F433	C1
F434	C1
F435	B3
F436	B2
F437	B2
F438	B2
F439	B1
F440	F3
F441	F3
F442	F3
F443	F2
F444	F3
F445	F3
F460	C4
F461	C4
F462	C4
F463	C4
F464	C4
F501	A2
F502	A4
F503	A1
F504	A1
F505	A1
F506	A1
F507	B1
F508	B1
F509	A3
F510	A1
F511	A1
F512	B1
F513	D3
F514	A1
F515	A3
F516	A2
F520	A4
F521	A4
F522	C1
F523	C1
F524	C1
F525	A4
F526	C1
F528	C1
F529	A4
F530	C1
F533	B1
F534	B2
F559	F1
F560	F1
F561	F1
F562	F1
F578	F1
F579	F1
F580	F1
F581	F1
F584	A4
F585	B4
F590	A4
F596	F3
F597	F4
F598	F4
F599	F4
F601	E4
F602	F4
F603	F3
F621	E4
F622	F4
F641	E4
F642	F4
F643	F4
F655	F4
F660	E3
F661	E3
F662	E4
F663	F4
F666	F3
F667	F4
F702	A2
F703	A2
F704	D4
F705	D4
F706	A1
F707	D4
F708	D4
F709	A1
F710	A1
F711	D4
F726	D4
F727	C4
F728	D4
F739	A3
F740	A3
F741	A4
F742	A3
F743	A3
F752	A1
F770	D4
F771	D4
F772	D4
F773	D4
F800	E2
F801	E1
F802	E1
F803	E1
F804	E1
F805	E1
F806	F1
F807	F2
F808	F2
F809	F1
F810	F2
F811	A1
F812	A1
F813	A1
F814	F2
F815	F1
F816	F2
F817	F1
F818	A1
F819	F2
F821	F3
F825	B4
F827	E3
F879	B3
F880	B3
F881	B1
F882	D1
F883	E3
F884	A1
F885	B3
F886	A3
F887	A3
F888	A2
F889	A2
F890	D3
F891	D4
F892	A3
F893	D3
F894	C3
F895	E4
F896	D3
F897	B2
F898	A3
F899	A3
I201	D2
I202	D2
I205	D2
I206	D2
I210	D2
I211	D2
I215	D2
I219	D1
I225	D2
I230	D1
I233	D2
I237	D1
I260	D2
I261	D1
I262	D2
I263	D2
I264	D2
I265	D1
I266	D2
I267	D2
I268	D2
I269	D1
I270	D2
I271	D2
I272	D2
I273	D2
I274	D2
I275	C2
I276	B2
I277	C2
I279	C2
I280	C2
I281	C2
I282	C2
I283	C2
I285	C2
I286	B2
I287	C2
I289	C2
I290	C2
I291	B2
I292	C2
I293	C2
I294	C2
I295	C2
I296	C2
I297	C2
I299	C2
I301	C3
I302	C3
I303	B4
I304	C3
I305	C3
I306	C3
I307	B4
I308	C3
I309	B4
I310	B4
I315	B3
I322	C4
I323	C4
I324	C4
I325	C4
I331	C4
I332	C4
I333	C4
I334	C4
I341	C3
I342	C3
I352	C3
I353	C3
I354	C3
I355	B3
I356	B3
I357	B4
I358	B4
I359	B4
I360	B3
I383	A4
I384	A3
I385	A4
I386	B3
I387	B3
I400	C2
I401	C2
I402	C2
I403	C2
I404	C2
I405	C2
I406	C2
I407	C2
I408	C2
I409	C2
I410	C2
I411	C2
I412	C2
I415	D2
I416	C2
I417	C3
I418	C2
I419	C2
I420	C2
I421	C2
I422	C2
I423	C1
I424	C1
I425	C1
I426	C1
I427	C1
I428	C1
I429	C1
I430	C1
I431	C1
I432	C1
I435	B1
I436	C1
I440	F2
I441	F2
I442	F3
I443	F2
I450	A2
I451	A2
I452	A2
I453	A2
I454	A2
I455	A2
I456	A2
I460	A3
I462	A3
I510	A3
I511	D4
I512	A1
I513	A1
I519	A2
I520	C1
I521	C1
I523	C1
I525	C1
I527	C1
I529	C1
I531	C1
I533	C1
I534	C1
I535	C1
I540	B2
I541	B2
I543	B2
I544	B2
I545	A3
I546	A3
I547	A3
I548	A2
I549	A2
I550	E1
I552	E1
I553	E1
I554	E1
I555	E1
I556	F1
I557	E1
I558	E1
I559	E1
I560	F1
I561	F1
I562	C1
I563	C1
I564	D1
I565	F1
I566	E1
I567	F1
I568	F1
I569	F1
I570	B2
I571	F1
I572	F1
I573	B2
I574	B2
I575	F1
I576	F1
I577	F1
I578	F1
I579	F1
I580	F1
I581	F1
I582	A4
I583	A4
I584	A4
I585	A4
I586	A4
I587	A4
I588	A4
I589	A4
I590	F1
I591	B4
I592	F1
I593	F1
I595	F1
I596	A2
I597	A3
I598	A3
I599	A3
I602	F4
I603	F4
I604	F4
I607	F4
I608	F4
I621	F4
I622	F3
I623	F3
I626	F4
I627	F4
I641	F3
I642	F3
I643	F3
I646	F3
I647	F4
I702	C4
I703	D3
I704	C4
I705	D3
I707	E3
I710	D3
I711	D3
I712	D3
I713	D3
I714	D3
I715	E3
I716	E3
I717	E3
I718	E3
I719	E3
I720	D3
I721	D3
I722	E3
I723	E3
I724	E3
I725	E3
I726	E3
I727	E3
I728	E3
I729	E3
I730	E3
I731	E3
I739	A3
I740	A3
I741	A3
I745	A3
I746	A3
I747	A3
I748	A2
I749	A2
I750	A1
I751	A1
I754	E4
I755	E4
I756	D4
I757	D4
I760	E4
I761	E4
I762	E3
I763	E4
I764	D3
I765	D4
I766	E3
I767	E4
I800	F2
I801	F2
I802	F2
I805	F2
I806	E2
I807	F2
I810	E2
I811	E2
I813	E2
I814	E2
I815	E2
I817	A1
I818	E2
I819	E2
I820	E2
I821	E2
I822	E2
I824	E2
I826	E2
I827	E2
I828	E2
I829	E2
I830	E2
I831	E2
I832	E2
I833	A1
I835	A1
I836	A1
I840	E1
I841	E1
I842	E1
I843	E1
I844	E1
I845	E1
I846	E1
I848	F1
I849	E1
I850	D1
I851	D1
I852	F2
I853	F2
I854	F1
I855	E1
I856	F1
I857	F1
I862	A1
I863	E1
I864	E1
I865	E1
I866	E1
I867	E1
I868	E1
I869	E1
I870	E1
I871	E1
I872	E1
I875	A1
I876	A1
I880	A2
I881	A2
I882	A2
I884	A2
I885	D4
I886	D3
I887	D4
I890	A3
I891	A3
I892	A3

CL 26532118_10m.eps
221002

Layout AVI Panel (Bottom Side)

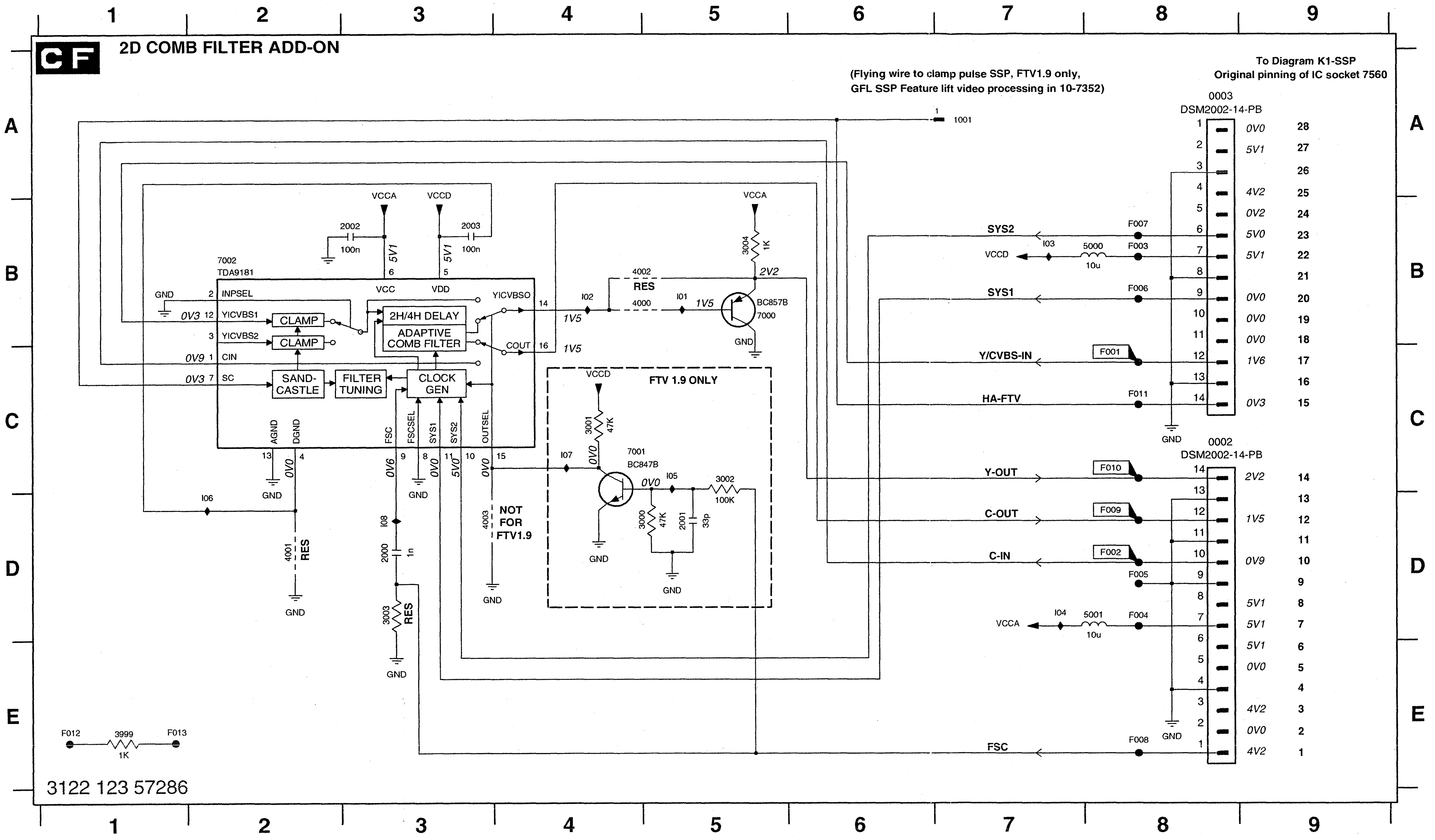


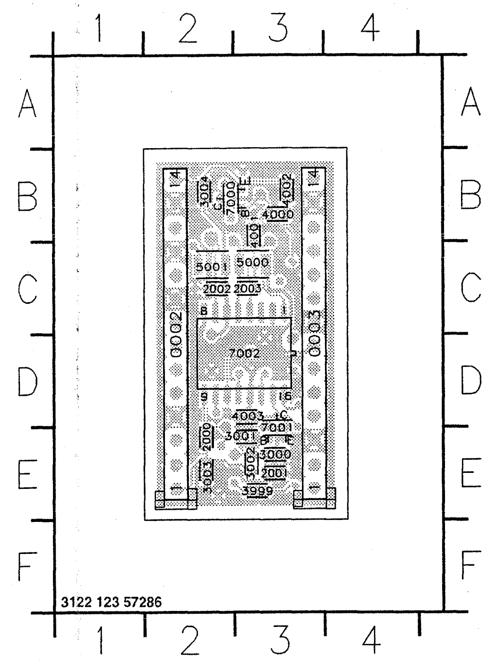
3122 123 60092

CL 26532118_010.eps
221002

2D Comb Filter Add-on

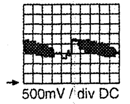
I01 B5	I03 B7	I05 C5	I07 C4	0002 C8	1001 A7	2001 D5	2003 B3	3001 C4	3003 D3	3999 E1	4001 D2	4003 D3	5001 D8	7001 C4	F001 C8	F003 B8	F005 D8	F007 B8	F009 D8	F011 C8	F013 E1
I02 B4	I04 D7	I06 D2	I08 C3	0003 A8	2000 D3	2002 B3	3000 D5	3002 C5	3004 B5	4000 B4	4002 B4	5000 B8	7000 B5	7002 B2	F002 D8	F004 D8	F006 B8	F008 E8	F010 C8	F012 E1	


CF
2D COMB FILTER ADD-ON
(Flying wire to clamp pulse SSP, FTV1.9 only,
GFL SSP Feature lift video processing in 10-7352)
To Diagram K1-SSP
Original pinning of IC socket 7560
0003
DSM2002-14-PB
0002
DSM2002-14-PB
1001
7002
TDA9181
INPSEL
YICVBS1
YICVBS2
CIN
SC
CLAMP
CLAMP
2H/4H DELAY
ADAPTIVE COMB FILTER
SAND-CASTLE
FILTER TUNING
CLOCK GEN
VCC
VDD
YICVBSO
COUT
AGND
DGND
FSC
FSCSEL
SYS1
SYS2
OUTSEL
VCCA
VCCD
2002 100n
2003 100n
5V1
4002 RES
4000
7000 BC857B
3004 1K
2V2
1V5
FTV 1.9 ONLY
3001 47K
7001 BC847B
3000 47K
2001 33p
3002 100K
4003 NOT FOR FTV1.9
4001 RES
2000 1n
3003 RES
GND
SYS2
VCCD
5000 10u
SYS1
Y/CVBS-IN
HA-FTV
Y-OUT
C-OUT
C-IN
VCCA
5001 10u
FSC
F001
F002
F003
F004
F005
F006
F007
F008
F009
F010
F011
F012
3999 1K
F013
3122 123 57286
A
B
C
D
E
1
2
3
4
5
6
7
8
9


1
2
3
4
A
B
C
D
E
F
0002
0003
7002
7000
7001
3122 123 57286

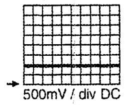
0002	C2
0003	C3
2000	E2
2001	E3
2002	C2
2003	C3
3000	E3
3001	E3
3002	E3
3003	E2
3004	B2
3999	E3
4000	B3
4001	B3
4002	B3
4003	D3
5000	C3
5001	C2
7000	B2
7001	E3
7002	D3

F001



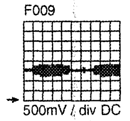
500mV / div DC
10µs / div

F002



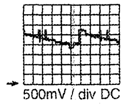
500mV / div DC
10µs / div

F009



500mV / div DC
10µs / div

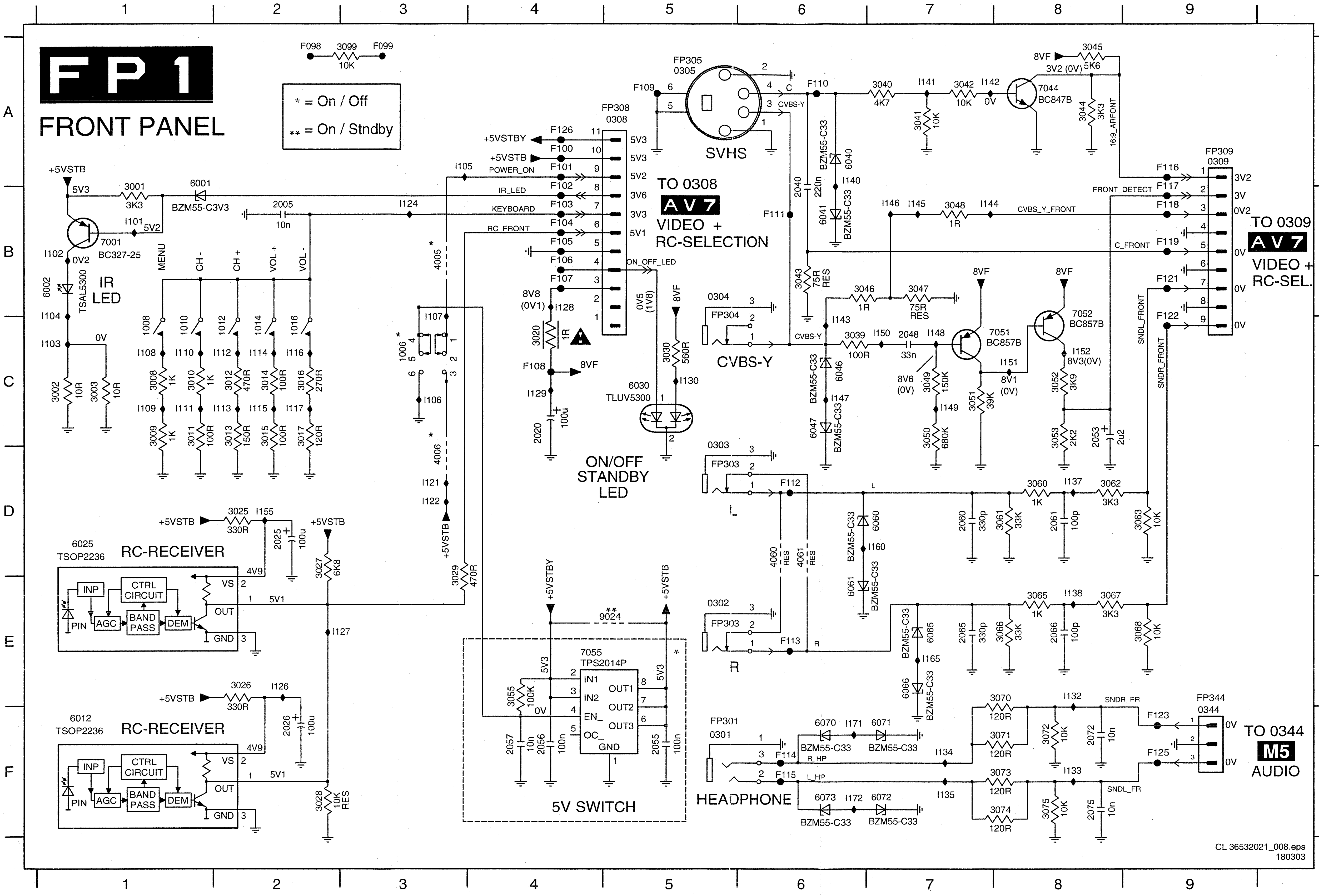
F010



500mV / div DC
10µs / div

CL 36532030_004.eps
040403

Front Panel

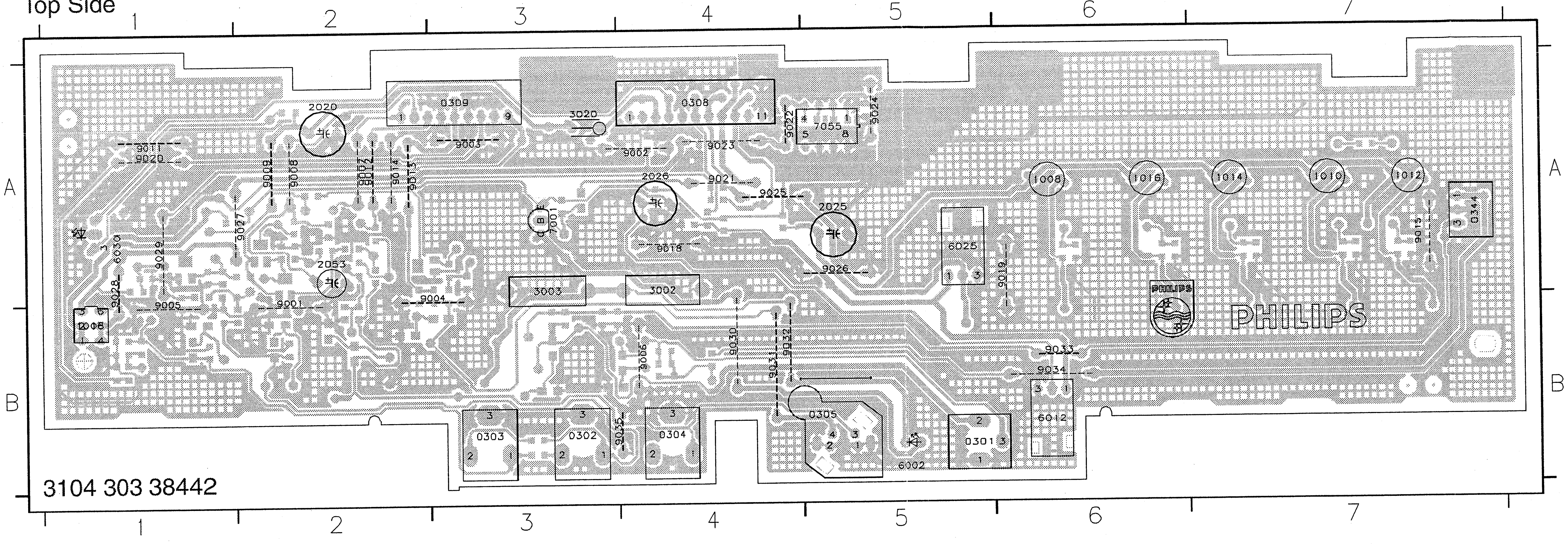

FP1
FRONT PANEL
F098 3099 10K F099
* = On / Off
** = On / Stndby
+5VSTB
5V3
3001 3K3
6001 BZM55-C3V3
I101 5V2
7001 BC327-25
I102 0V2
6002 TSAL5300
IR LED
I104
I103
0V
3002 10R
3003 10R
2005 10n
I124
MENU
CH -
CH +
VOL +
VOL -
1008
1010
1012
1014
1016
I108 3008 1K I109 3009 1K
I110 3010 1K I111 3011 100R
I112 3012 470R I113 3013 150R
I114 3014 100R I115 3015 100R
I116 3016 270R I117 3017 120R
I105 POWER_ON
IR_LED
KEYBOARD
RC_FRONT
4005
1006
I107
I106
4006
I121
I122
+5VSTB
3029 470R
+5VSTBY F126
+5VSTB F100
F101
F102
F103
F104
F105
F106
F107
FP308 0308
5V3 5V3 5V2 3V6 3V3 5V1
ON_OFF_LED
TO 0308
AV7
VIDEO +
RC-SELECTION
8V8 (0V1) I128
3020 1R
F108 8VF
I129
2020 100u
0V5 (1V8)
8VF
3030 560R
I130
6030 TLUV5300
ON/OFF
STANDBY
LED
FP305 0305
F109
SVHS
C
CVBS-Y
F110
3040 4K7
I141
3041 10K
3042 10K
I142 0V
8VF
3045 5K6
3V2 (0V)
7044 BC847B
3044 3K3
16:9_ARFONT
2040 220n
BZM55-C33 6040
I140
6041 BZM55-C33
F111
I146 I145 3048 1R I144 CVBS_Y_FRONT
3043 75R RES
3046 1R
3047 75R RES
I143
0304 FP304
CVBS-Y
3039 100R I150 2048 33n I148
6046 BZM55-C33
I147
6047 BZM55-C33
8V6 (0V)
3049 150K
I149
3050 680K
8VF
7051 BC857B
3051 39K
I151 8V1 (0V)
8VF
7052 BC857B
I152 8V3(0V)
3052 3K9
3053 2K2
2053 2u2
FRONT_DETECT
C_FRONT
F116 F117 F118 F119 F121 F122
SNDL_FRONT
SNDR_FRONT
FP309 0309
3V2 3V 0V2 0V 0V 0V
TO 0309
AV7
VIDEO +
RC-SEL.
0303 FP303
F112
L
L
6060 BZM55-C33
I160
6061 BZM55-C33
4060 RES
4061 RES
2060 330p
3061 33K
3060 1K
I137
2061 100p
3062 3K3
3063 10K
0302 FP303
F113
R
R
6065 BZM55-C33
I165
6066 BZM55-C33
2065 330p
3066 33K
3065 1K
I138
2066 100p
3067 3K3
3068 10K
+5VSTB 3025 330R I155
2025 100u
+5VSTB
3027 6K8
6025 TSOP2236
RC-RECEIVER
INP
CTRL CIRCUIT
AGC
BAND PASS
DEM
PIN
VS
OUT
GND
4V9
5V1
I127
+5VSTB 3026 330R I126
2026 100u
6012 TSOP2236
RC-RECEIVER
3028 10K RES
+5VSTBY
+5VSTB
9024
7055 TPS2014P
5V3
IN1 IN2 EN_ OC_ GND
OUT1 OUT2 OUT3
3055 100K
0V
2057 10n
2056 100n
2055 100n
5V SWITCH
FP301 0301
F114 R_HP
F115 L_HP
HEADPHONE
6070 I171 6071
BZM55-C33 BZM55-C33
6073 I172 6072
BZM55-C33 BZM55-C33
I134
I135
3070 120R
3071 120R
I132
3072 10K
2072 10n
SNDR_FR
3073 120R
3074 120R
I133
3075 10K
2075 10n
SNDL_FR
F123
F125
FP344 0344
0V 0V
TO 0344
M5
AUDIO
CL 36532021_008.eps
180303

0301	F5
0302	E5
0303	D5
0304	B5
0305	A5
0308	A5
0309	A9
0344	F9
1006	C3
1008	C1
1010	C1
1012	C2
1014	C2
1016	C2
2005	B2
2020	C4
2025	D2
2026	F2
2040	B6
2048	C7
2053	C8
2055	F5
2056	F4
2057	F4
2060	D7
2061	D8
2065	E7
2066	E8
2072	F8
2075	F8
3001	B1
3002	C1
3003	C1
3008	C1
3009	C1
3010	C1
3011	C1
3012	C2
3013	C2
3014	C2
3015	C2
3016	C2
3017	C2
3020	C4
3025	D2
3026	E2
3027	D2
3028	F2
3029	D3
3030	C5
3039	C6
3040	A7
3041	A7
3042	A7
3043	B6
3044	A8
3045	A8
3046	B6
3047	B7
3048	B7
3049	C7
3050	C7
3051	C7
3052	C8
3053	C8
3055	E4
3057	F3
3060	D8
3061	D8
3062	D8
3063	D9
3065	E8
3066	E8
3067	E8
3068	E9
3070	E8
3071	F8
3072	F8
3073	F8
3074	F8
3075	F8
3099	A3
4005	B3
4006	D3
4007	B3
4060	D6
4061	D6
6001	B1
6002	B1
6012	F1
6025	D1
6030	C5
6040	A6
6041	B6
6046	C6
6047	C6
6060	D7
6061	E6
6065	E7
6066	E7
6070	F6
6071	F7
6072	F7
6073	F6
7001	B1
7044	A8
7051	C7
7052	B8
7055	E4
9024	E5
F098	A2
F099	A3
F100	A4
F101	A4
F102	B4
F103	B4
F104	B4
F105	B4
F106	B4
F107	B4
F108	C4
F109	A5
F110	A6
F111	B6
F112	D6
F113	E6
F114	F6
F115	F6
F116	A9
F117	B9
F118	B9
F119	B9
F121	B9
F122	C9
F123	F9
F125	F9
F126	A4
I101	B1
I102	B1
I103	C1
I104	B1
I105	A3
I106	C3
I107	C3
I108	C1
I109	C1
I110	C1
I111	C1
I112	C2
I113	C2
I114	C2
I115	C2
I116	C2
I117	C2
I121	D3
I122	D3
I124	B3
I126	E2
I127	E3
I128	B4
I129	C4
I130	C5
I131	B3
I132	E8
I133	F8
I134	F7
I135	F7
I137	D8
I138	E8
I140	A6
I141	A7
I142	A7
I143	C6
I144	B7
I145	B7
I146	B7
I147	C6
I148	C7
I149	C7
I150	C7
I151	C8
I152	C8
I155	D2
I160	D7
I165	E7
I171	F6
I172	F6

Layout Front Panel

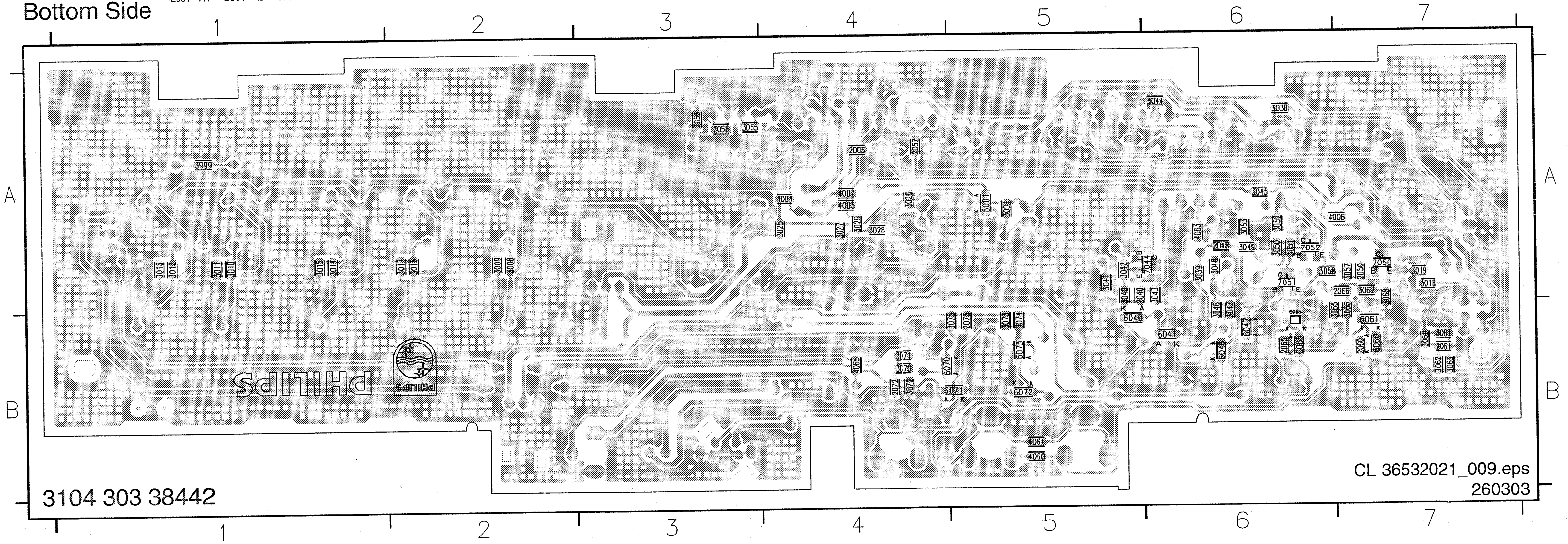
0301	B5	0308	A4	1010	A7	2020	A2	3003	A3	6030	A1	9003	A3	9008	A2	9014	A2	9021	A4	9026	A5	9031	B4
0302	B3	0309	A2	1012	A7	2025	A5	3020	A3	7001	A3	9004	A3	9009	A2	9015	A7	9022	A4	9027	A2	9032	B4
0303	B3	0344	A7	1014	A7	2026	A4	6002	B5	7055	A5	9005	B1	9011	A1	9018	A4	9023	A4	9028	A1	9033	B6
0304	B4	1006	B1	1016	A6	2053	A2	6012	B6	9001	A2	9006	B4	9012	A2	9019	B6	9024	A5	9029	A1	9034	B6
0305	B5	1008	A6	1018	B1	3002	A4	6025	A5	9002	A4	9007	A2	9013	A2	9020	A1	9025	A4	9030	B4	9035	B3

Top Side


1
2
3
4
5
6
7
A
B
0309
3020
0308
7055
9022
9024
2020
9011
9020
9003
9002
9023
9009
9008
9013
9012
9014
9015
2026
9021
9025
1008
1016
1014
1010
1012
0344
2025
6030
9029
9027
7001
9018
9026
6025
9019
9015
2053
3003
3002
9028
9005
9001
9004
PHILIPS
9006
9030
9031
9032
9033
9034
6012
0305
0303
0302
0304
9035
6002
0301
3104 303 38442

2005	A4	2060	B7	3008	A2	3015	A1	3027	A4	3042	A5	3049	A6	3058	A6	3067	A7	3075	B5	4061	B5	6047	B6	6072	B5
2040	A5	2061	B7	3009	A2	3016	A2	3028	A4	3043	A6	3050	A6	3060	B7	3068	A7	3999	A1	4063	A6	6060	B7	6073	B5
2048	A6	2065	B6	3010	A1	3017	A2	3029	A4	3044	A6	3051	A6	3061	B7	3070	B4	4004	A4	4065	B4	6061	B7	7044	A6
2050	A7	2066	A7	3011	A1	3018	A7	3030	A6	3045	A6	3052	A6	3062	B7	3071	B4	4005	A4	6001	A5	6065	B6	7050	A7
2055	A3	2072	B4	3012	A1	3019	A7	3039	A6	3046	B6	3053	A6	3063	B7	3072	B4	4006	A7	6040	B5	6066	B6	7051	A6
2056	A3	2075	B5	3013	A1	3025	A4	3040	A5	3047	B6	3055	A3	3065	B6	3073	B5	4007	A4	6041	B6	6070	B5	7052	A6
2057	A4	3001	A5	3014	A1	3026	A4	3041	A5	3048	A6	3057	A7	3066	B7	3074	B5	4060	B5	6046	B6	6071	B4		

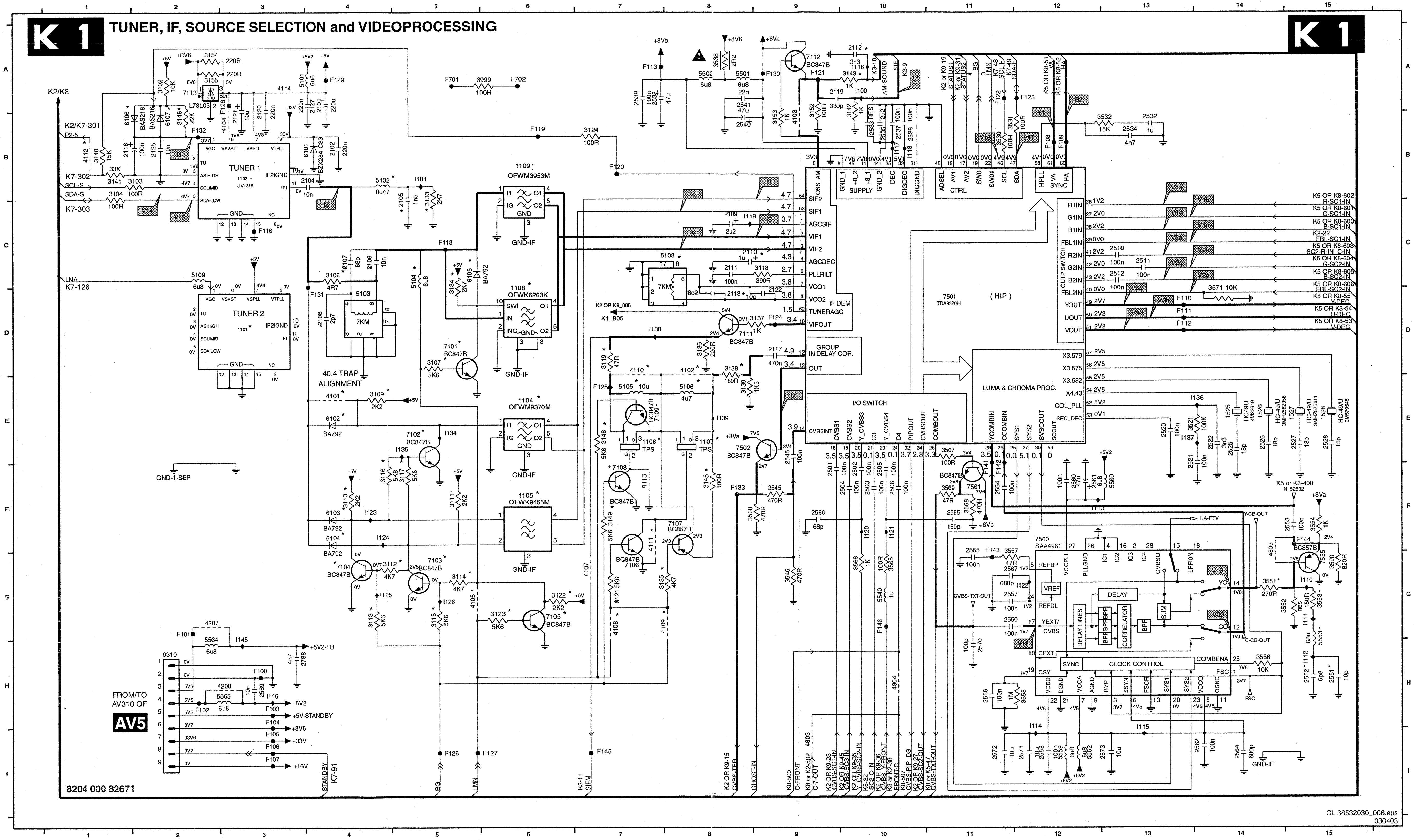
Bottom Side


1
2
3
4
5
6
7
A
B
3999
3044
2005
4004
4007
4005
3028
6001
3043
4006
2048
3049
7052
7050
7051
3019
3018
6040
6041
6061
3051
6071
6072
4061
4060
PHILIPS
3104 303 38442

CL 36532021_009.eps
260303

Small Signal Board: Tuner IF, Source Selection and Video Processing

0310	H2
1101	D3
1102	B3
1104	E6
1105	F6
1106	E7
1107	E8
1108	D6
1109	B6
1525	E14
1526	E14
1527	E15
1528	E15
2101	A4
2102	B4
2104	B4
2105	B5
2106	C4
2107	C4
2108	D4
2109	C8
2110	C8
2111	C8
2112	A10
2116	B1
2117	D9
2118	D8
2119	A9
2120	A3
2121	B3
2122	D9
2125	B2
2127	A4
2501	F9
2502	F10
2503	F10
2504	F10
2505	F10
2506	F10
2510	C13
2511	C13
2512	C13
2520	E13
2521	E13
2522	E14
2525	E14
2526	E14
2527	E15
2528	E15
2532	B13
2533	B10
2534	B13
2535	B10
2536	B10
2537	B10
2538	A7
2539	A7
2540	B8
2541	A8
2545	E9
2550	G11
2551	H15
2552	H15
2553	F15
2554	F11
2555	G11
2556	H11
2557	G11
2558	I12
2560	F12
2561	F12
2562	I14
2564	I14
2565	F11
2566	F9
2567	G11
2569	H3
2570	H11
2571	I12
2572	I11
2573	I13
2788	H3
3102	A2
3103	B2
3104	B1
3106	C4
3107	D5
3109	E4
3110	F4
3111	F5
3112	G4
3113	G4
3114	G5
3115	G5
3116	F4
3117	F5
3118	C9
3119	D7
3121	G7
3122	G6
3123	G6
3124	B7
3133	B5
3134	C5
3135	G7
3136	D8
3137	D9
3138	D8
3139	E8
3140	B1
3141	B1
3142	A10
3143	A10
3145	F8
3146	B2
3148	E7
3149	F7
3152	A9
3153	B9
3154	A2
3155	A2
3521	E13
3530	B11
3531	B11
3532	B13
3538	A8
3545	F9
3546	G9
3551	G14
3552	G15
3553	G15
3554	F15
3556	H14
3557	G11
3558	H12
3560	F8
3565	G10
3566	G10
3567	E11
3568	F11
3569	F11
3571	D14
3590	G15
3999	A6
4101	E4
4102	D8
4103	B9
4104	B3
4105	G5
4107	G7
4108	G7
4109	G8
4110	D7
4111	F7
4112	B1
4113	F7
4114	A3
4207	G2
4208	H3
4803	I9
4804	H10
4809	F14
5101	A3
5102	B4
5103	D4
5104	C5
5105	E7
5106	E8
5108	C7
5109	C2
5501	A8
5502	A8
5540	G10
5553	G15
5559	I12
5560	F13
5562	I12
5564	H2
5565	H3
6101	B4
6102	E4
6103	F4
6104	F4
6105	C5
6106	B1
6107	B2
7101	D5
7102	E5
7103	G5
7104	G4
7105	G6
7106	G7
7107	F8
7108	F7
7109	E7
7111	D8
7112	A9
7113	A2
7501	D11
7502	E8
7555	G15
7560	F12
7561	F11
F100	H3
F101	G2
F102	H2
F103	H3
F104	H3
F105	I3
F106	I3
F107	I3
F108	B12
F109	B12
F110	D13
F111	D13
F112	D13
F113	A7
F116	C3
F118	C5
F119	B6
F120	B7
F121	A9
F122	A11
F123	A12
F124	D9
F125	E7
F126	I5
F127	I6
F128	A3
F129	A4
F130	A9
F131	D4
F132	B2
F133	F8
F141	F11
F142	F11
F143	G11
F144	F15
F145	I7
F146	G10
F701	A5
F702	A6
I100	A10
I101	B5
I110	G15
I111	G15
I112	H15
I113	F12
I114	H12
I115	H13
I116	A10
I117	B10
I118	B10
I119	C8
I120	F10
I121	F10
I122	G12
I123	F4
I124	F4
I125	G4
I126	G5
I134	E5
I135	E5
I136	E14
I137	E13
I138	D7
I139	E8
I145	H3
I146	H3

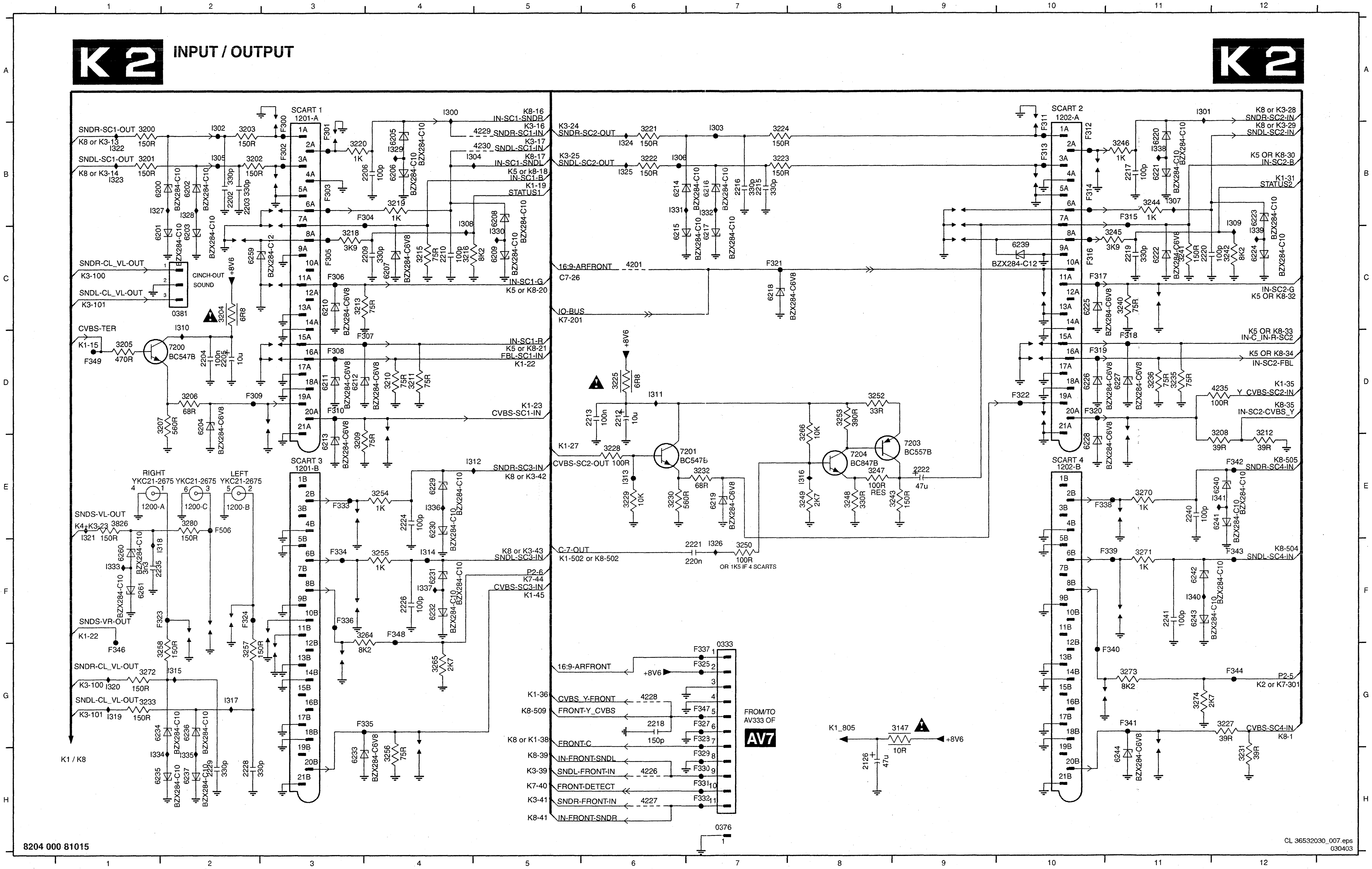

K 1 TUNER, IF, SOURCE SELECTION and VIDEOPROCESSING **K 1**

K2/K8
K2/K7-301
K7-302
SCL-S
SDA-S
K7-303
LNA
K7-126
TUNER 1
UV1316
TUNER 2
1109 OFWK3953M
1108 OFWK6263K
1104 OFWM9370M
1105 OFWK9455M
40.4 TRAP ALIGNMENT
GND-1-SEP
GND-IF
7501 TDA9320H
(HIP)
IF DEM
GROUP IN DELAY COR.
I/O SWITCH
LUMA & CHROMA PROC.
OUTP SWITCH
SUPPLY
CTRL
SYNC
7560 SAA4961
DELAY LINES
CORRELATOR
DELAY
SUM
CLOCK CONTROL
VREF
HA-FTV
Y-CB-OUT
C-CB-OUT
K5 OR K8-602 R-SC1-IN
K5 OR K8-601 G-SC1-IN
K5 OR K8-600 B-SC1-IN
K2-22 FBL-SC1-IN
K5 OR K8-603 SC2-R-IN C-IN
K5 OR K8-604 G-SC2-IN
K5 OR K8-605 B-SC2-IN
K5 OR K8-606 FBL-SC2-IN
K5 OR K8-55 Y-DEC
K5 OR K8-54 U-DEC
K5 OR K8-53 V-DEC
K5 or K8-400 N_52502
FROM/TO AV310 OF
AV5
8204 000 82671
STANDBY K7-91
BG
LMN
K3-11 SIFM
K2 OR K9-15 CVBS-TER
GHOST-IN
K8-500 C-FRONT
K8 or K2-502 C-FRONT
CVBS-PIP_DS
CVBS-TXT-OUT
+5V2-FB
+5V2
+5V-STANDBY
+8V6
+33V
+16V
+8Vb
+8V6
+8Va

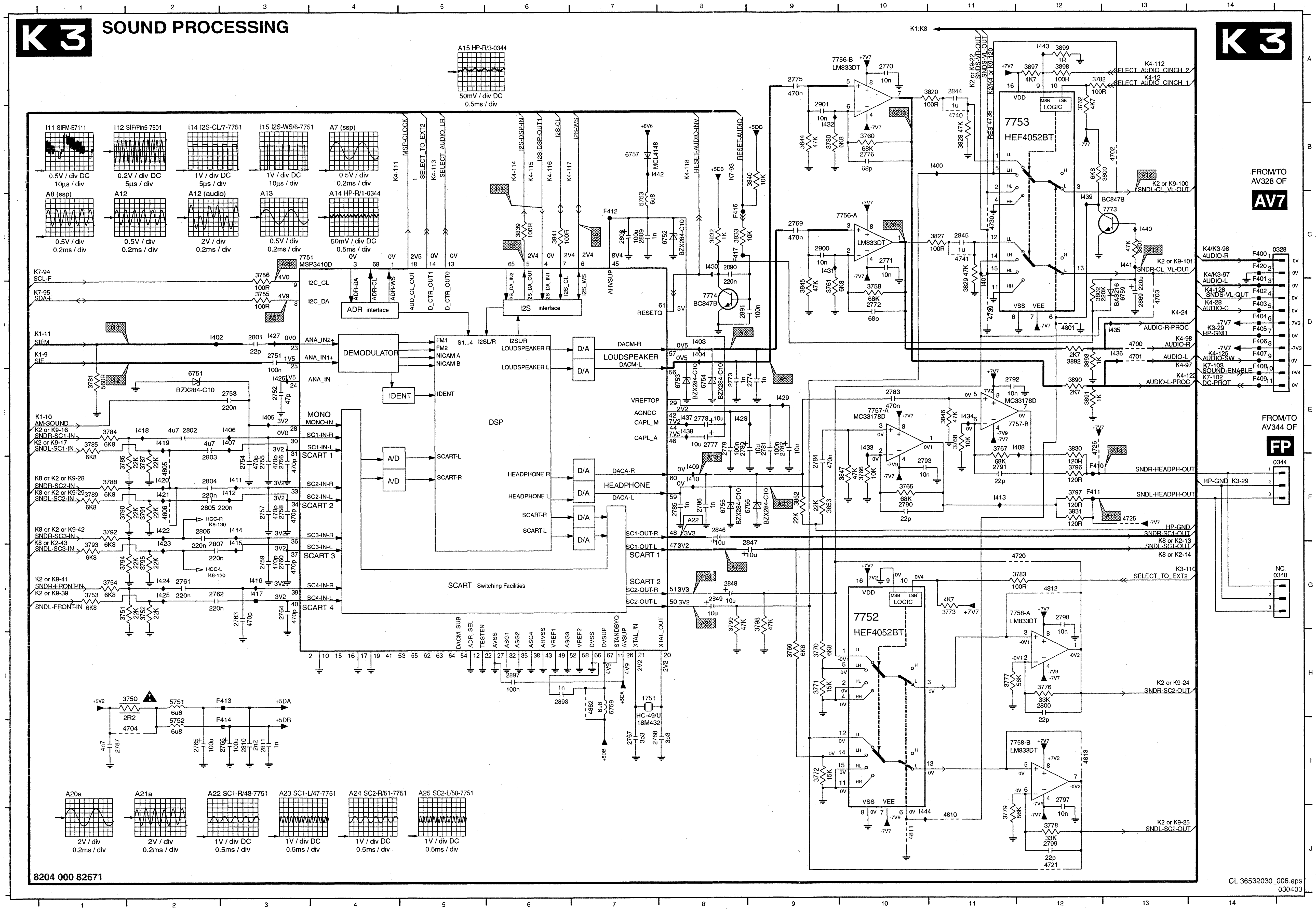
CL 36532030_006.eps
030403

Small Signal Board: Input/Output

0333	F7
0376	H8
0381	C2
1200-A	E1
1200-B	E2
1200-C	E2
1201-A	A3
1201-B	E3
1202-A	A10
1202-B	E10
2126	H8
2202	B2
2203	B2
2204	D2
2205	D2
2206	B4
2209	C4
2210	C4
2212	E6
2213	E6
2215	B7
2216	B7
2217	B11
2218	G6
2219	C11
2220	C11
2221	F7
2222	F9
2224	E4
2226	F4
2228	H2
2229	H2
2235	F1
2240	E11
2241	F11
3147	G9
3200	B1
3201	B1
3202	B2
3203	B2
3204	C2
3205	D1
3206	D2
3207	D2
3208	E12
3209	E3
3210	D4
3211	D4
3212	E12
3213	C3
3215	C4
3216	C4
3218	C3
3219	B4
3220	B3
3221	B6
3222	B6
3223	B7
3224	B7
3225	D6
3227	G12
3228	E6
3229	F6
3230	F6
3231	H12
3232	E7
3233	G1
3235	D11
3236	D11
3240	C11
3241	C11
3242	C12
3243	F9
3244	B11
3245	C11
3246	B11
3247	F8
3248	F8
3249	F8
3250	F7
3252	F8
3253	F8
3254	E4
3255	F4
3256	H4
3257	G2
3258	G2
3264	F4
3265	G4
3266	F8
3270	E11
3271	F11
3272	G1
3273	G11
3274	G11
3280	E2
3826	E1
4201	C6
4226	H6
4227	H6
4228	G6
4229	B5
4230	B5
4235	D12
6200	B1
6201	C1
6202	B2
6203	C2
6204	D2
6205	B4
6206	B4
6207	C4
6208	B5
6209	C5
6210	C3
6211	D3
6212	D3
6213	E3
6214	B6
6215	C6
6216	B7
6217	C7
6218	C7
6219	D7
6220	B11
6221	B11
6222	C11
6223	B12
6224	C12
6225	C10
6226	D10
6227	D11
6228	E10
6229	E4
6230	E4
6231	F4
6232	F4
6233	H3
6234	G1
6235	H1
6236	G2
6237	H2
6239	C10
6240	E12
6241	E12
6242	F11
6243	F11
6244	H11
6259	C2
6260	F1
6261	F1
7200	D2
7201	E6
7203	F9
7204	F8
F300	B3
F301	B3
F302	B3
F303	B3
F304	B4
F305	C3
F306	C3
F307	D4
F308	D3
F309	D2
F310	D3
F311	B10
F312	B10
F313	B10
F314	B10
F315	B11
F316	C10
F317	C10
F318	D11
F319	D10
F320	D10
F321	C7
F322	D10
F323	F2
F324	F2
F325	G7
F327	G7
F328	G7
F329	G7
F330	H7
F331	H7
F332	H7
F333	E3
F334	F3
F335	G4
F336	F3
F337	F7
F338	E10
F339	F11
F340	G11
F341	G11
F342	E12
F343	F12
F344	G12
F346	G1
F347	G7
F348	F4
F349	D1
F506	E2
I300	A4
I301	A11
I302	B2
I303	B7
I304	B4
I305	B2
I306	B6
I307	B11
I308	B4
I309	B12
I310	C2
I311	E6
I312	E4
I313	E6
I314	F4
I315	G2
I316	F8
I317	G2
I318	F1
I319	G1
I320	G1
I321	E1
I322	B1
I323	B1
I324	B6
I325	B6
I326	F7
I327	B1
I328	B2
I329	B4
I330	C5
I331	B6
I332	B7
I333	F1
I334	H1
I335	H2
I336	E4
I337	F4
I338	B11
I339	C12
I340	F11
I341	E12

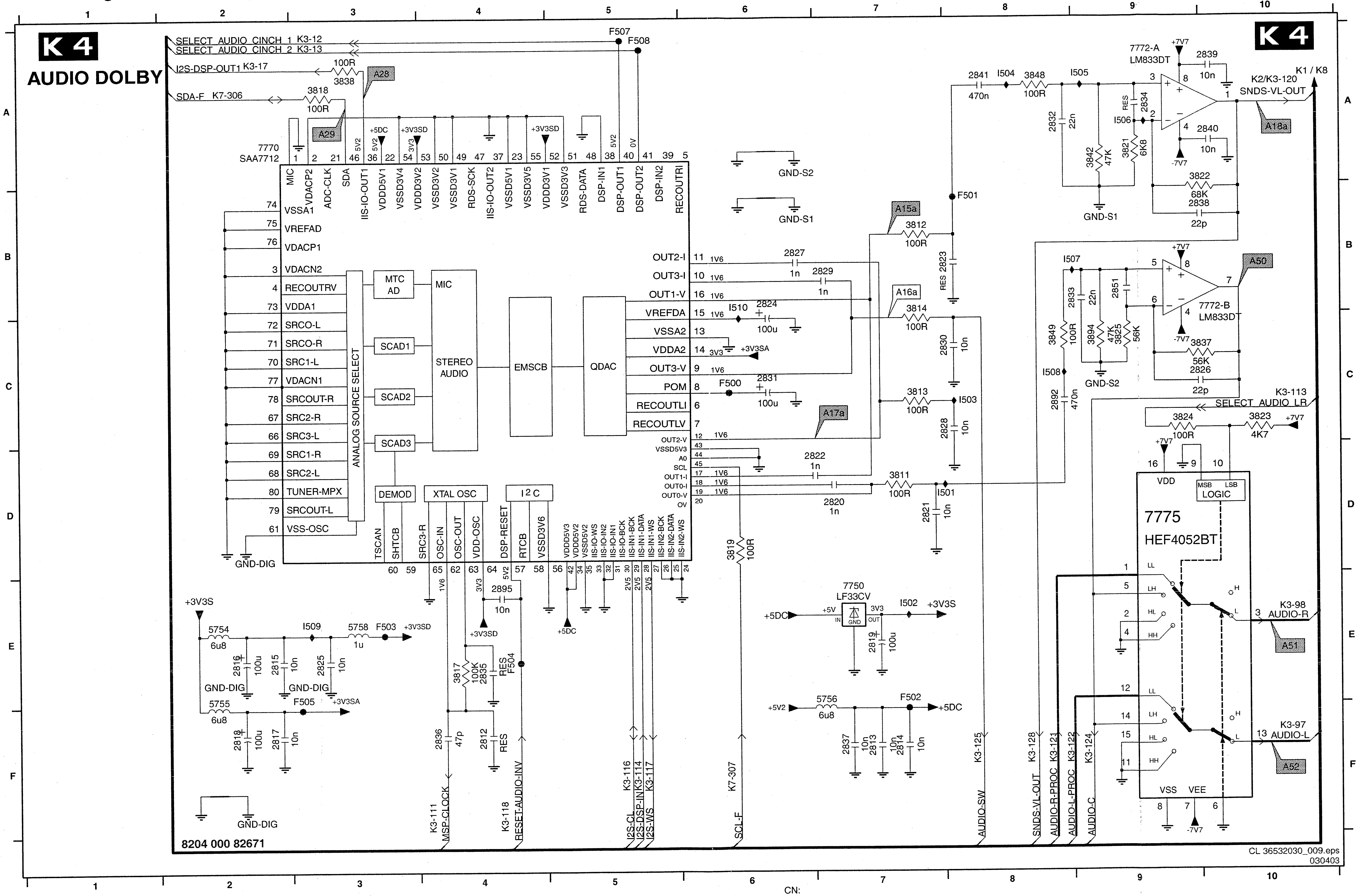

K2
INPUT / OUTPUT
K2
SCART 1
1201-A
SCART 2
1202-A
SCART 3
1201-B
SCART 4
1202-B
SNDR-SC1-OUT
K8 or K3-13
SNDL-SC1-OUT
K8 or K3-14
SNDR-CL_VL-OUT
K3-100
SNDL-CL_VL-OUT
K3-101
CINCH-OUT
SOUND
0381
CVBS-TER
K1-15
7200
BC547B
K8-16
IN-SC1-SNDR
K3-16
SNDR-SC1-IN
K3-17
SNDL-SC1-IN
K8-17
IN-SC1-SNDL
K5 or k8-18
IN-SC1-B
K1-19
STATUS1
IN-SC1-G
K5 or K8-20
IN-SC1-R
K5 or K8-21
FBL-SC1-IN
K1-22
K1-23
CVBS-SC1-IN
SNDR-SC3-IN
K8 or K3-42
K8 or K3-43
SNDL-SC3-IN
P2-6
K7-44
CVBS-SC3-IN
K1-45
RIGHT
YKC21-2675
LEFT
SNDS-VL-OUT
K4+K3-23
SNDS-VR-OUT
K1-22
SNDR-CL_VL-OUT
K3-100
SNDL-CL_VL-OUT
K3-101
K1 / K8
K3-24
SNDR-SC2-OUT
K3-25
SNDL-SC2-OUT
16:9-ARFRONT
C7-26
IO-BUS
K7-201
K1-27
CVBS-SC2-OUT
7201
BC547B
7203
BC557B
7204
BC847B
C-7-OUT
K1-502 or K8-502
OR 1K5 IF 4 SCARTS
16:9-ARFRONT
K1-36
CVBS_Y-FRONT
K8-509
FRONT-Y_CVBS
K8 or K1-38
FRONT-C
K8-39
IN-FRONT-SNDL
K3-39
SNDL-FRONT-IN
K7-40
FRONT-DETECT
K3-41
SNDR-FRONT-IN
K8-41
IN-FRONT-SNDR
0333
FROM/TO
AV333 OF
AV7
0376
K1_805
+8V6
K8 or K3-28
SNDR-SC2-IN
K8 or K3-29
SNDL-SC2-IN
K5 OR K8-30
IN-SC2-B
K1-31
STATUS2
IN-SC2-G
K5 OR K8-32
K5 OR K8-33
IN-C_IN-R-SC2
K5 OR K8-34
IN-SC2-FBL
K1-35
Y_CVBS-SC2-IN
K8-35
IN-SC2-CVBS_Y
K8-505
SNDR-SC4-IN
K8-504
SNDL-SC4-IN
P2-5
K2 or K7-301
CVBS-SC4-IN
K8-1
8204 000 81015
CL 36532030_007.eps
030403

Small Signal Board: Sound Processing


K3
SOUND PROCESSING
A15 HP-R/3-0344
50mV / div DC
0.5ms / div
I11 SIFM-E7111
0.5V / div DC
10µs / div
I12 SIF/Pin5-7501
0.2V / div DC
5µs / div
I14 I2S-CL/7-7751
1V / div DC
5µs / div
I15 I2S-WS/6-7751
1V / div DC
10µs / div
A7 (ssp)
0.5V / div
0.2ms / div
A8 (ssp)
0.5V / div
0.2ms / div
A12
0.5V / div
0.2ms / div
A12 (audio)
2V / div
0.2ms / div
A13
0.5V / div
0.2ms / div
A14 HP-R/1-0344
50mV / div DC
0.5ms / div
7751
MSP3410D
ADR interface
I2S interface
DEMODULATOR
IDENT
DSP
D/A
A/D
LOUDSPEAKER
HEADPHONE
SCART Switching Facilities
SCART 1
SCART 2
SCART 3
SCART 4
MSP-CLOCK
SELECT_TO_EXT2
SELECT_AUDIO_LR
I2S-DSP-IN
I2S-DSP-OUT1
I2S-CL
I2S-WS
RESET-AUDIO-INV
RESET-AUDIO
BC847B
7774
7756-A
7756-B
LM833DT
7757-A
7757-B
MC33178D
7758-A
7758-B
7752
7753
HEF4052BT
LOGIC
7773
BC847B
K1:K8
SELECT_AUDIO_CINCH_2
SELECT_AUDIO_CINCH_1
SNDL-CL_VL-OUT
SNDR-CL_VL-OUT
AUDIO-R
AUDIO-L
SNDS-VL-OUT
AUDIO-C
HP-GND
AUDIO-SW
SOUND-ENABLE
DC-PROT
AUDIO-R-PROC
AUDIO-L-PROC
SNDR-HEADPH-OUT
SNDL-HEADPH-OUT
SNDR-SC1-OUT
SNDL-SC1-OUT
SELECT_TO_EXT2
SNDR-SC2-OUT
SNDL-SC2-OUT
FROM/TO
AV328 OF
AV7
FROM/TO
AV344 OF
FP
0328
0344
0348
NC.
SIFM
SIF
AM-SOUND
SNDR-SC1-IN
SNDL-SC1-IN
SNDR-SC2-IN
SNDL-SC2-IN
SNDR-SC3-IN
SNDL-SC3-IN
SNDR-FRONT-IN
SNDL-FRONT-IN
SCL-F
SDA-F
+5DA
+5DB
HC-49/U
18M432
A20a
2V / div
0.2ms / div
A21a
2V / div
0.2ms / div
A22 SC1-R/48-7751
1V / div DC
0.5ms / div
A23 SC1-L/47-7751
1V / div DC
0.5ms / div
A24 SC2-R/51-7751
1V / div DC
0.5ms / div
A25 SC2-L/50-7751
1V / div DC
0.5ms / div
8204 000 82671
CL 36532030_008.eps
030403

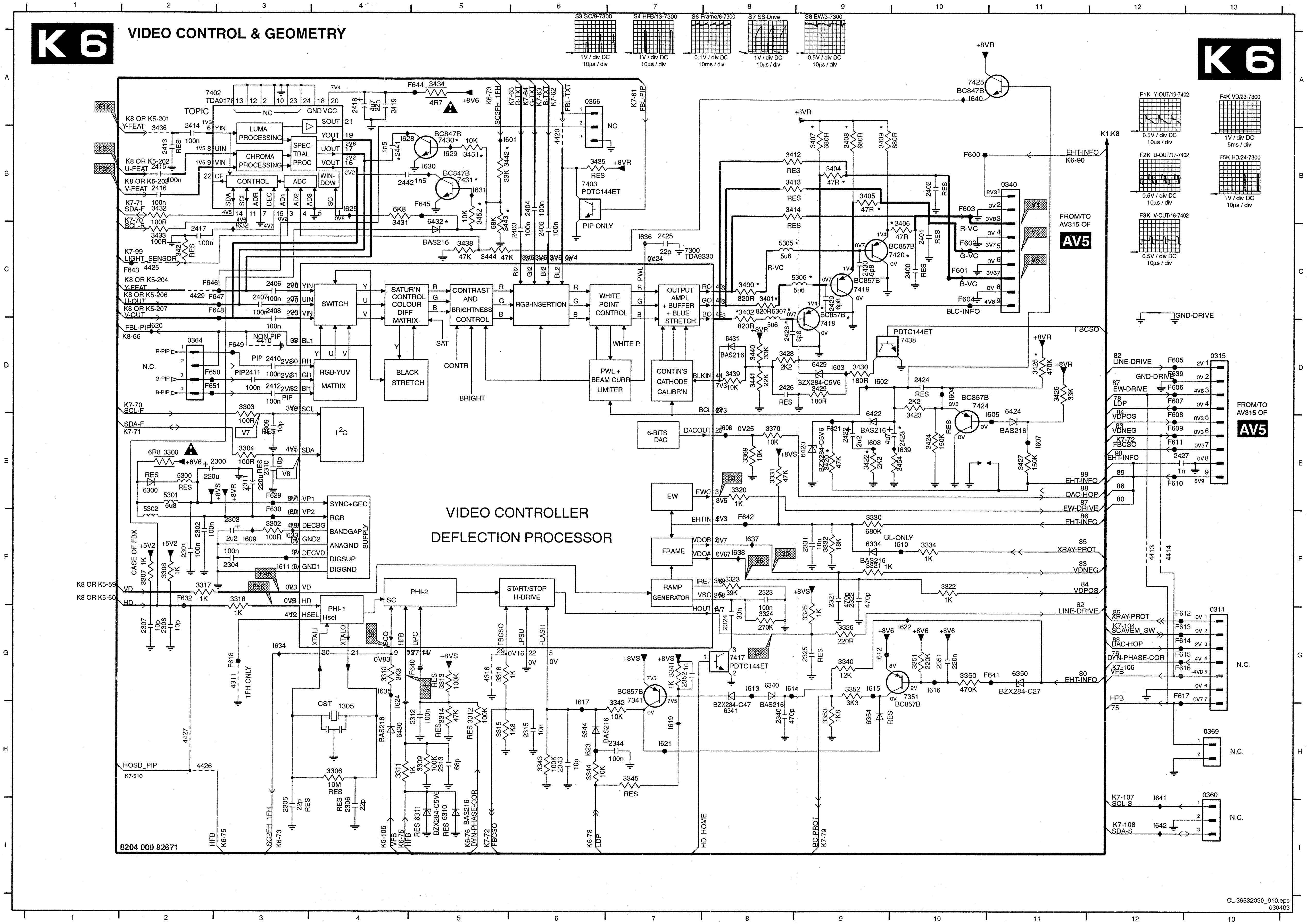
0328	C14
0344	F14
0348	G14
1751	H7
2751	D3
2752	E3
2753	E3
2754	F3
2755	F3
2756	F3
2757	F3
2758	F3
2759	G3
2760	G3
2761	G2
2762	G2
2763	G3
2764	G3
2765	I2
2766	I3
2767	I7
2768	I7
2769	C9
2770	A10
2771	C10
2772	D10
2773	E8
2774	E9
2775	A9
2776	B10
2777	E8
2778	E8
2779	E8
2780	E8
2781	E9
2782	E9
2783	E10
2784	F9
2785	F8
2786	F8
2787	I1
2790	F10
2791	F11
2792	E11
2793	F10
2797	I12
2798	G12
2799	J12
2800	H12
2801	D3
2802	E2
2803	E2
2804	F2
2805	F2
2806	F2
2807	G2
2808	C7
2809	C7
2810	I3
2811	I3
2844	A11
2845	C11
2846	F8
2847	F9
2848	G8
2849	G8
2869	D13
2890	C8
2891	D8
2897	H6
2898	H6
2900	C9
2901	B9
3750	H2
3751	G1
3752	G2
3753	G1
3754	G1
3755	D3
3756	C3
3758	D10
3760	B10
3761	D9
3762	B12
3765	F10
3766	F10
3767	E11
3768	E11
3769	H9
3770	H9
3771	H9
3772	I9
3773	G11
3776	H12
3777	H11
3778	J12
3779	J11
3780	B9
3781	E1
3782	A12
3783	G11
3784	E1
3785	E1
3786	F1
3787	F2
3788	F1
3789	F1
3790	F1
3791	F2
3792	F1
3793	G1
3794	G1
3795	G2
3796	F12
3797	F12
3798	G9
3799	G8
3800	B13
3801	C13
3802	D12
3820	A11
3827	C11
3828	B11
3829	D11
3830	E12
3831	F12
3832	C8
3833	C8
3839	C6
3840	B9
3841	C6
3844	B9
3845	D9
3846	E11
3847	F10
3852	F9
3853	F9
3890	E12
3891	E12
3892	D12
3893	D12
3897	A12
3898	A12
3899	A12
4700	D13
4701	D13
4702	B13
4703	D13
4704	I2
4720	G11
4721	J12
4725	F13
4726	E12
4730	C11
4738	B11
4739	D11
4740	B11
4741	C11
4801	D12
4805	F2
4806	F2
4810	J11
4811	J10
4812	G12
4813	I12
4862	H7
5751	H2
5752	I2
5753	C7
5759	H7
6751	E2
6752	C8
6753	E8
6754	E8
6755	F8
6756	F9
6757	B7
6759	D13
7751	C3
7752	G10
7753	B11
7756-A	C9
7756-B	A9
7757-A	E10
7757-B	E12
7758-A	G11
7758-B	I11
7773	C13
7774	D8
F400	C14
F401	D14
F402	D14
F403	D14
F404	D14
F405	D14
F406	D14
F407	D14
F408	E14
F409	E14
F410	F12
F411	F12
F412	C7
F413	H3
F414	I3
F416	C8
F417	C8
F420	C14
I400	B11
I401	D11
I402	D2
I403	D8
I404	D8
I405	E3
I406	E3
I407	E3
I408	E12
I409	F8
I410	F8
I411	F3
I412	F3
I413	F11
I414	F3
I415	F3
I416	G3
I417	G3
I418	E2
I419	E2
I420	F2
I421	F2
I422	F2
I423	F2
I424	G2
I425	G2
I426	E3
I427	D3
I428	E8
I429	E9
I430	C8
I431	C9
I432	B9
I433	E10
I434	E11

Small Signal Board: Audio Dolby


K 4
AUDIO DOLBY
SELECT_AUDIO_CINCH_1 K3-12
SELECT_AUDIO_CINCH_2 K3-13
I2S-DSP-OUT1 K3-17
SDA-F K7-306
7770 SAA7712
3818 100R
3838 100R
A28
A29
F507
F508
MIC
VDACP2
ADC-CLK
SDA
IIS-IO-OUT1
VDDD5V1
VSSD3V4
VDDD3V2
VSSD3V2
VSSD3V1
RDS-SCK
IIS-IO-OUT2
VSSD5V1
VSSD3V5
VDDD3V1
VSSD3V3
RDS-DATA
DSP-IN1
DSP-OUT1
DSP-OUT2
DSP-IN2
RECOUTRI
VSSA1
VREFAD
VDACP1
VDACN2
RECOUTRV
VDDA1
SRCO-L
SRCO-R
SRC1-L
VDACN1
SRCOUT-R
SRC2-R
SRC3-L
SRC1-R
SRC2-L
TUNER-MPX
SRCOUT-L
VSS-OSC
ANALOG SOURCE SELECT
MTC AD
MIC
SCAD1
SCAD2
SCAD3
STEREO AUDIO
EMSCB
QDAC
DEMOD
XTAL OSC
I2C
OUT2-I
OUT3-I
OUT1-V
VREFDA
VSSA2
VDDA2
OUT3-V
POM
RECOUTLI
RECOUTLV
TSCAN
SHTCB
SRC3-R
OSC-IN
OSC-OUT
VDD-OSC
DSP-RESET
RTCB
VSSD3V6
GND-DIG
GND-S2
GND-S1
F500
F501
I510
2824 100u
2831 100u
2827 1n
2829 1n
2822 1n
2820 1n
A15a
A16a
A17a
3812 100R
3814 100R
3813 100R
3811 100R
2823 RES
2830 10n
2828 10n
2821 10n
I501
I503
3819 100R
2841 470n
I504
3848 100R
I505
7772-A LM833DT
2839 10n
2840 10n
2834 RES
2832 22n
I506
3842 47K
3821 6K8
3822 68K
2838 22p
K2/K3-120
SNDS-VL-OUT
K1 / K8
A18a
7772-B LM833DT
A50
I507
2833 22n
2851
3849 100R
3894 47K
3825 56K
3837 56K
2826 22p
I508
2892 470n
GND-S2
K3-113
SELECT_AUDIO_LR
3824 100R
3823 4K7
+7V7
-7V7
7775 HEF4052BT
VDD
MSB LSB
LOGIC
LL
LH
HL
HH
H
L
VSS VEE
K3-98 AUDIO-R
A51
K3-97 AUDIO-L
A52
+3V3S
5754 6u8
I509
5758 1u
F503 +3V3SD
2816 100u
2815 10n
2825 10n
5755 6u8
F505 +3V3SA
2818 100u
2817 10n
2895 10n
3817 100K
2835 RES
F504 RES
2836 47p
2812 RES
7750 LF33CV
+5DC
I502
+3V3S
2819 100u
+5V2
5756 6u8
F502
2837 10n
2813 10n
2814 10n
K3-111 MSP-CLOCK
K3-118 RESET-AUDIO-INV
K3-116 I2S-CL
K3-114 I2S-DSP-IN
K3-117 I2S-WS
K7-307 SCL-F
K3-125 AUDIO-SW
K3-128 SNDS-VL-OUT
K3-121 AUDIO-R-PROC
K3-122 AUDIO-L-PROC
K3-124 AUDIO-C
8204 000 82671
CL 36532030_009.eps 030403
CN:

2812	F4
2813	F7
2814	F7
2815	E2
2816	E2
2817	F2
2818	F2
2819	E7
2820	D7
2821	D7
2822	D7
2823	B8
2824	B6
2825	E3
2826	C10
2827	B6
2828	C8
2829	B7
2830	C8
2831	C6
2832	A8
2833	B9
2834	A9
2835	E4
2836	F4
2837	F7
2838	B10
2839	A10
2840	A10
2841	A8
2851	B9
2892	C8
2895	E4
3811	D7
3812	B7
3813	C7
3814	B7
3817	E4
3818	A3
3819	D6
3821	A9
3822	A10
3823	C10
3824	C9
3825	C9
3837	C10
3838	A3
3842	A9
3848	A8
3849	C8
3894	C9
5754	E2
5755	E2
5756	E7
5758	E3
7750	E7
7770	A2
7772-A	A9
7772-B	B9
7775	D9
F500	C6
F501	B8
F502	E7
F503	E3
F504	E4
F505	E3
F507	A5
F508	A5
I501	D8
I502	E7
I503	C8
I504	A8
I505	A9
I506	A9
I507	B9
I508	C8
I509	E3
I510	B6

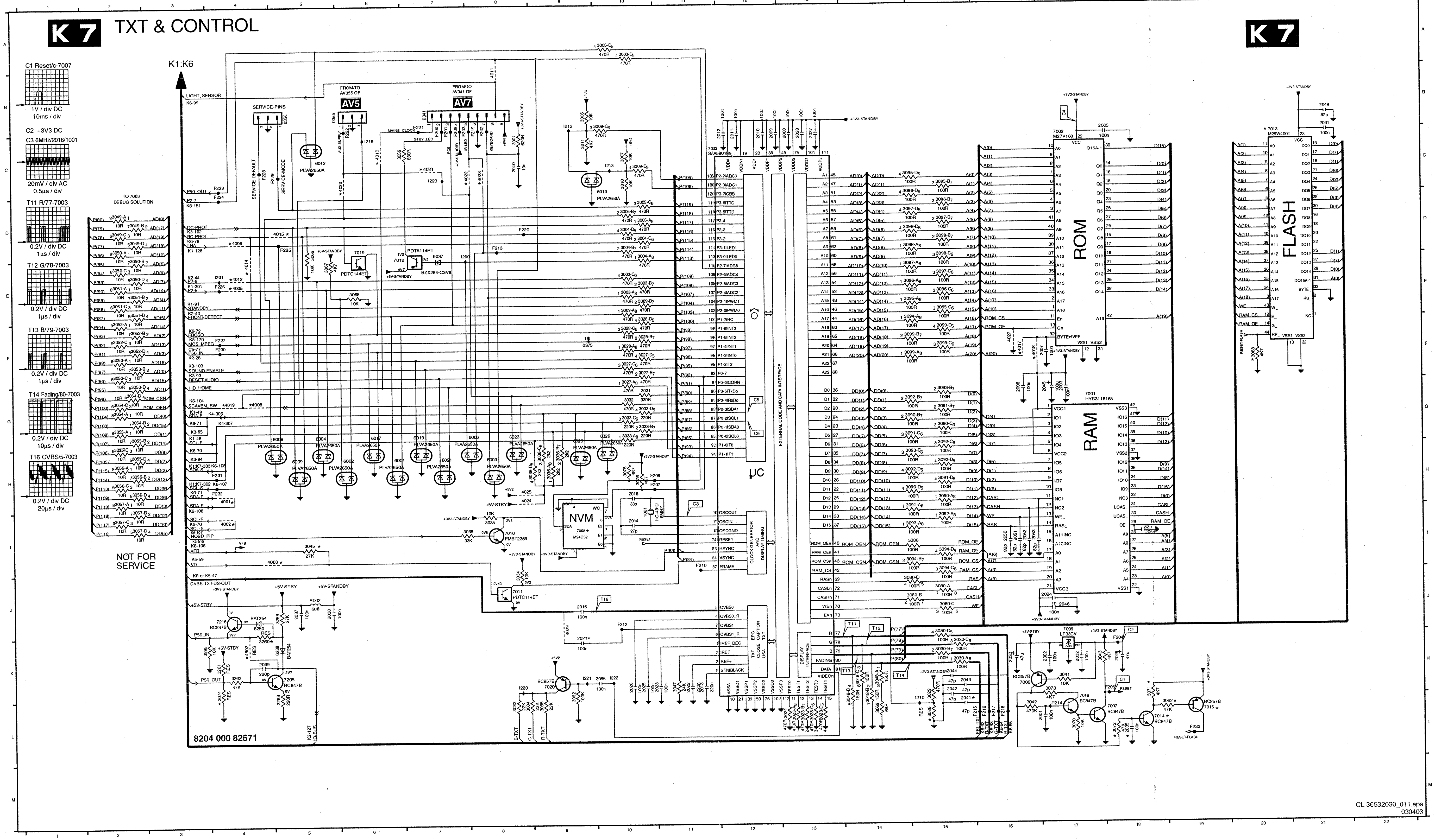
Small Signal Board: Video Control and Geometry


K6
VIDEO CONTROL & GEOMETRY
VIDEO CONTROLLER
DEFLECTION PROCESSOR
7402 TDA9178
TOPIC
LUMA PROCESSING
CHROMA PROCESSING
SPEC-TRAL PROC
CONTROL
ADC
WIN-DOW
SWITCH
SATUR'N CONTROL COLOUR DIFF MATRIX
CONTRAST AND BRIGHTNESS CONTROL
RGB-INSERTION
WHITE POINT CONTROL
OUTPUT AMPL + BUFFER + BLUE STRETCH
BLACK STRETCH
RGB-YUV MATRIX
PWL + BEAM CURR LIMITER
CONTIN'S CATHODE CALIBR'N
6-BITS DAC
I²C
SYNC+GEO
EW
FRAME
RAMP GENERATOR
PHI-1 Hsel
PHI-2
START/STOP H-DRIVE
7300 TDA9330
PIP ONLY
FROM/TO AV315 OF
AV5
S3 SC/9-7300
S4 HFB/13-7300
S6 Frame/6-7300
S7 SS-Drive
S8 EW/3-7300
F1K Y-OUT/19-7402
F2K U-OUT/17-7402
F3K V-OUT/16-7402
F4K VD/23-7300
F5K HD/24-7300
K8 OR K5-201 Y-FEAT
K8 OR K5-202 U-FEAT
K8 OR K5-203 V-FEAT
K8 OR K5-204 Y-FEAT
K8 OR K5-206 U-OUT
K8 OR K5-207 V-OUT
K8 OR K5-59 VD
K8 OR K5-60 HD
EHT-INFO K6-90
XRAY-PROT
VDNEG
VDPOS
LINE-DRIVE
EW-DRIVE
DAC-HOP
DYN-PHASE-COR
GND-DRIVE
HOSD_PIP K7-510
8204 000 82671
CL 36532030_010.eps
030403

0311	G13
0315	D13
0340	B11
0360	H13
0364	D2
0366	A6
0369	H13
1305	H4
2300	E3
2301	F2
2302	F2
2303	F3
2304	F3
2305	I3
2306	I4
2307	G2
2308	G2
2309	E3
2310	E3
2311	E3
2312	H5
2313	H5
2315	H6
2321	F9
2322	F9
2323	F8
2324	G8
2325	G9
2331	F9
2340	H8
2343	H6
2344	H7
2351	G10
2352	G7
2400	C10
2401	C10
2402	B10
2403	C6
2404	B6
2405	C6
2406	C3
2407	C3
2408	C3
2410	D3
2411	D3
2412	D3
2413	B2
2414	B2
2415	B2
2416	B2
2417	C2
2418	A4
2419	A4
2422	E9
2423	E10
2424	D10
2425	C7
2426	D8
2427	E12
2428	D8
2429	C9
2430	C9
2441	B4
2442	B4
3300	E2
3302	F3
3303	D3
3304	E3
3306	H4
3307	F2
3308	F2
3309	H5
3310	G4
3311	H4
3312	H5
3313	G5
3314	H5
3315	H5
3316	G5
3317	F2
3318	F3
3320	E8
3321	F9
3322	F10
3323	F8
3324	G8
3325	G9
3326	G9
3330	F9
3331	E8
3332	F9
3334	F10
3340	G9
3341	G7
3342	H7
3343	H6
3344	H6
3345	H7
3350	G10
3351	G10
3352	G9
3353	H9
3369	E8
3370	E8
3400	C8
3401	C8
3402	C8
3404	B9
3405	B9
3406	C10
3407	B9
3408	B9
3409	B9
3412	B8
3413	B8
3414	B8
3420	E9
3421	C2
3422	E9
3423	D10
3424	E10
3425	D11
3426	D11
3427	E11
3428	D8
3429	D9
3430	D9
3431	B4
3432	B2
3433	C2
3434	A5
3435	B6
3436	B2
3438	C5
3439	D8
3440	D8
3441	D8
3442	B5
3443	C5
3444	C5
3451	B5
3452	B5
3454	E10
4311	G3
4316	G5
4410	D3
4413	F12
4414	F12
4420	B6
4425	C2
4426	H2
4427	H2
4429	C2
5300	E2
5301	E2
5302	F2
5305	C8
5306	C9
5307	C8
6300	E2
6310	I5
6311	I5
6334	F9
6340	G8
6341	H8
6344	H6
6350	G11
6354	H9
6420	E9
6422	E9
6424	D11
6429	D9
6430	H4
6431	D8
6432	C5
7300	C7
7341	G7
7351	G10
7402	A2
7403	B6
7417	G8
7418	D9
7419	C9
7420	C9
7424	D11
7425	A10
7430	B5
7431	B5
7438	D10
F600	B10
F601	C10
F602	C10
F603	B10
F604	C10
F605	D12
F606	D12
F607	D12
F608	E12
F609	E12
F610	E12
F611	E12
F612	G13
F613	G13
F614	G13
F615	G13
F616	G13
F617	G13
F618	G3
F621	E9
F629	E3
F630	F3
F632	F2
F639	D12
F640	G5
F641	G11
F642	F8
F643	C2
F644	A5
F645	B5
F646	C2
F647	C3
F648	C3
F649	D3
F650	D2
F651	D2
I601	B5
I602	D9
I603	D9
I604	D10
I605	E11
I606	E8
I607	E11
I608	E9
I609	F3
I610	F10
I611	F3
I612	G9
I613	G8
I614	G8
I615	G9
I616	G10
I617	H6
I619	H7
I620	D2
I621	H7
I622	G10
I623	H6
I624	H4
I625	B4
I628	B4
I629	B5
I630	B5
I631	B5
I632	C3
I633	F3
I634	G3
I635	G4
I636	C7
I637	F8
I638	F8
I639	E10
I640	A10
I641	H12
I642	I12

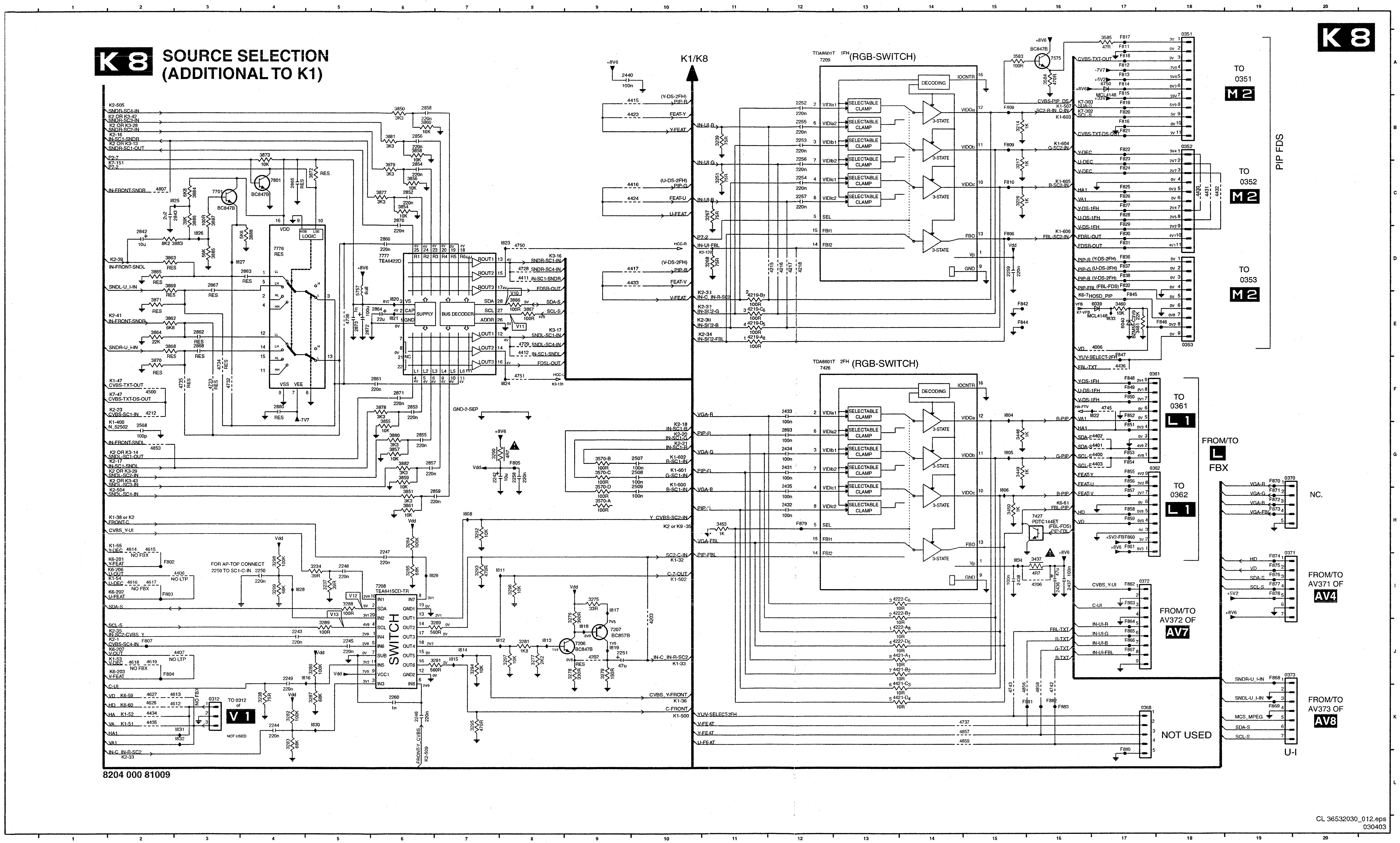
Small Signal Board: TXT and Control

0341	B7
0355	B6
0356	B5
0375	F9
1001	I10
2001	L16
2002	K17
2003	G17
2005	B18
2006	G16
2007	F17
2008	C13
2009	C12
2010	C12
2011	C12
2012	C12
2013	K11
2014	I10
2015	J9
2016	H10
2021	K9
2022	K11
2023	K11
2024	J17
2025	K10
2026	K10
2027	C13
2028	C13
2029	K18
2030	K16
2031	B21
2032	K17
2035	L18
2037	J5
2038	J5
2039	K4
2040	C8
2041	L15
2042	K15
2043	K15
2044	K15
2045	G17
2046	J17
2049	B21
2050	I16
2051	I16
2052	I16
2053	I16
2054	I18
2055	K10
3001	C8
3003-A	E10
3003-B	E10
3003-C	E10
3003-D	A10
3004-A	D10
3004-B	D10
3004-C	D10
3004-D	D10
3005-A	D10
3005-B	D10
3005-C	D10
3005-D	A10
3006	B9
3007	C10
3009-A	E10
3009-B	E10
3009-C	B10
3009-D	C10
3010	C10
3011	C9
3023-A	L13
3023-B	L13
3023-C	L13
3023-D	L13
3024	L13
3026	L15
3027-A	F10
3027-B	F10
3027-C	F10
3027-D	F10
3028-A	F10
3028-B	F10
3028-C	F10
3028-D	E10
3029	K15
3030-A	K15
3030-B	K15
3030-C	K15
3030-D	J15
3031	G10
3032	G10
3033-A	G10
3033-B	G10
3033-C	G10
3033-D	G10
3034	J8
3035	I8
3036-A	H9
3036-B	H9
3036-C	H9
3036-D	H9
3039	I7
3041	K17
3042	L16
3043	K17
3045	I5
3047	K11
3048-A	K14
3048-B	K14
3048-C	K14
3048-D	K14
3049-A	D2
3049-B	D2
3049-C	D2
3049-D	D2
3050-A	D2
3050-B	D2
3050-C	E2
3050-D	E2
3051-A	E2
3051-B	E2
3051-C	E2
3051-D	E2
3052-A	E2
3052-B	F2
3052-C	F2
3052-D	F2
3053-A	F2
3053-B	F2
3053-C	F2
3053-D	F2
3054-A	G2
3054-B	G2
3054-C	G2
3054-D	G2
3055-A	G2
3055-B	G2
3055-C	G2
3055-D	H2
3056-A	H2
3056-B	H2
3056-C	H2
3056-D	H2
3057-A	H2
3057-B	H2
3057-C	I2
3057-D	I2
3059	C7
3062	L18
3063	F20
3066	D5
3067	E5
3068	E6
3069	L14
3070	L17
3071	K18
3072	L18
3073	K17
3074	K4
3075	H10
3076	H10
3080-A	J15
3080-B	J15
3080-C	J15
3080-D	J15
3082	K9
3083	L8
3084	L8
3085	L9
3086	I15
3090-A	H15
3090-B	G15
3090-C	G15
3090-D	H15
3091-A	H15
3091-B	G15
3091-C	G15
3091-D	H15
3092-A	H15
3092-B	G15
3092-C	G15
3092-D	I15
3093-A	H15
3093-B	H15
3093-C	G15
3093-D	I15
3094-A	E15
3094-B	I15
3094-C	I15
3094-D	E15
3095-A	C15
3095-B	I15
3095-C	C15
3095-D	E15
3096-A	C15
3096-B	E15
3096-C	D15
3096-D	E15
3097-A	D15
3097-B	E15
3097-C	D15
3097-D	E15
3098-A	D15
3098-B	D15
3098-C	D15
3098-D	D15
3099-A	F15
3099-B	F15
3099-C	F15
3099-D	F15
3259	J5
3260	K4
3261	K4
3262	K4
3263	K5
3895	K3
4001	H4
4002	I4
4003	I4
4005	E4
4008	G4
4009	D4
4010	C6
4011	B8
4012	E4
4014	E4
4015	D5
4017	F16
4018	F16
4019	G4
4020	C6
4021	C7
4022	C8
4023	C8
4024	H8
4025	H8
4027	F16
4029	J9
4802	K4
5002	J5
6001	H7
6002	H6
6003	H8
6004	G5
6006	G8
6008	G5
6009	H5
6012	C5
6013	C10
6017	G6
6019	G7
6021	H7
6023	G8
6025	G9
6026	G10
6037	D7
6238	K5
6250	J4
7001	G17
7002	C17
7003	C11
7006	K16
7007	L18
7008	I9
7009	J17
7010	I8
7011	J8
7012	E7
7013	C20
7014	L18
7015	L19
7016	L17
7019	D6
7020	K9
7205	K5
7216	J4
F200	B7
F201	B7
F202	B8
F203	B7
F204	K18
F205	K18
F207	H10
F208	H10
F209	B7
F210	I11
F212	J10
F213	D8
F214	L17
F215	L15
F216	L16
F217	L16
F218	L16
F219	B8
F220	D8
F221	B7
F222	B6
F223	C4
F224	C4
F225	D5
F226	E4
F227	F4
F228	C4
F229	C5
F230	F4
F231	H4
F232	H4
F233	L19
I200	D7
I201	E4
I210	L15
I212	B9
I213	C10
I219	C6
I220	K8
I221	K9
I222	K10
I223	C7

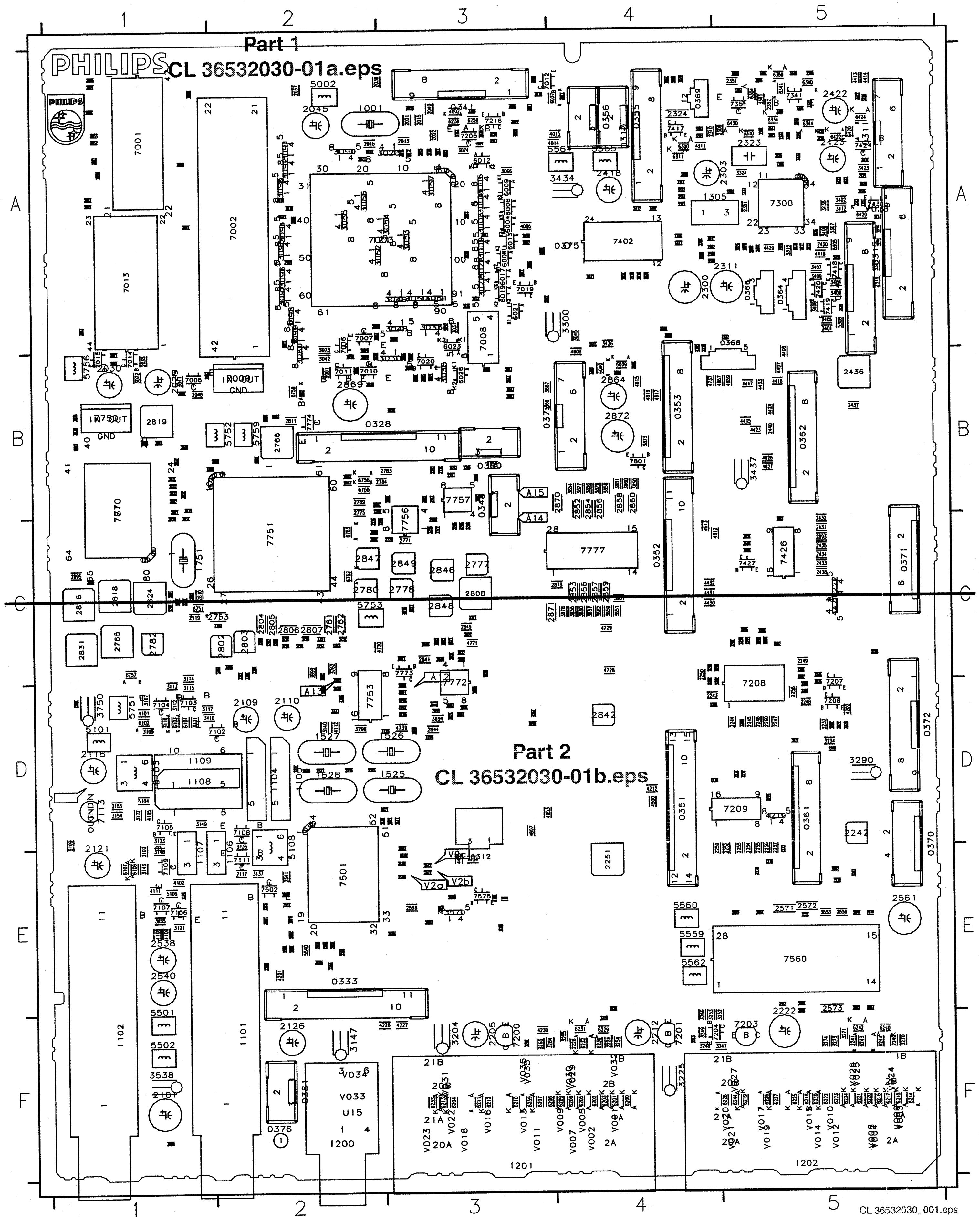

K 7
TXT & CONTROL
K 7
C1 Reset/c-7007
1V / div DC
10ms / div
C2 +3V3 DC
C3 6MHz/2016/1001
20mV / div AC
0.5µs / div
T11 R/77-7003
0.2V / div DC
1µs / div
T12 G/78-7003
0.2V / div DC
1µs / div
T13 B/79-7003
0.2V / div DC
1µs / div
T14 Fading/80-7003
0.2V / div DC
10µs / div
T16 CVBS/5-7003
0.2V / div DC
20µs / div
NOT FOR SERVICE
TO 7003 DEBUG SOLUTION
K1:K6
SERVICE-PINS
AV5
AV7
7003 SAA5801
µC
EXTERNAL CODE AND DATA INTERFACE
CLOCK GENERATOR AND DISPLAY TIMING
DISPLAY INTERFACE
NVM
ROM
7002 M27V160
RAM
7001 HYB3118165
FLASH
7013 M29W400T
+3V3-STANDBY
+5V-STBY
8204 000 82671
CL 36532030_011.eps
030403

Small Signal Board: Source Selection Add. to Diagram K1

0312	K3
0351	A18
0352	B18
0353	E18
0361	F17
0362	G17
0368	K17
0370	G19
0371	I19
0372	I17
0373	J19
2242	G7
2243	J4
2244	K4
2245	J5
2246	K6
2247	H6
2248	I5
2249	J4
2250	I4
2251	J9
2252	B12
2253	B12
2254	C12
2255	B12
2256	B12
2257	C12
2258	G8
2259	D15
2260	K6
2431	G12
2432	H12
2433	F12
2434	G12
2435	G12
2436	I16
2437	I16
2438	I15
2440	A9
2507	G10
2508	G10
2509	G10
2568	G2
2842	D2
2843	C2
2852	C6
2853	F6
2854	C6
2855	G6
2856	B6
2857	G6
2858	B6
2859	H7
2860	D6
2861	F6
2862	E3
2863	D4
2864	E6
2865	C4
2867	D3
2868	E3
2870	C6
2871	F6
2872	E5
2873	E5
2880	F4
2893	G12
3214	B15
3217	C15
3226	C15
3234	I5
3237	I5
3238	K4
3239	B11
3251	C11
3267	C11
3268	D11
3269	J7
3275	I9
3276	I9
3277	J8
3278	J9
3279	J9
3281	J8
3282	K4
3283	K4
3284	H6
3285	I6
3286	J5
3287	K5
3288	I5
3289	J5
3290	G7
3291	J7
3292	H7
3293	I7
3294	J7
3295	K7
3296	I8
3297	J8
3298	I4
3299	I4
3437	I16
3448	G15
3449	G15
3450	H15
3453	H11
3460	E17
3461	E17
3570-A	H9
3570-B	G9
3570-C	G9
3570-D	H9
3583	A15
3584	A16
3585	A17
3850	B6
3851	H6
3854	C6
3855	G6
3856	C6
3857	G6
3858	B6
3859	G6
3860	B6
3861	H6
3862	E2
3863	D2
3864	E2
3865	D2
3866	E8
3867	E8
3868	E2
3869	D2
3870	F2
3871	E2
3872	C5
3873	B4
3877	C6
3878	F6
3879	C6
3880	G6
3881	B6
3882	G6
3883	D3
3884	C3
3885	D3
3886	C3
3887	C3
3888	D4
4006	E17
4202	J9
4203	I10
4206	I16
4212	F2
4215	D12
4216	D12
4217	D12
4218	D12
4219-A	E11
4219-B	E11
4219-C	E11
4219-D	E11
4222-A	J14
4222-B	I14
4222-C	I14
4222-D	J14
4400	G17
4401	G17
4402	G17
4403	G17
4406	I3
4407	J3
4411	D8
4412	E8
4415	B10
4416	C10
4417	D10
4421-A	J14
4421-B	J14
4421-C	K14
4421-D	K14
4423	B10
4424	C10
4430	C18
4431	C18
4432	C18
4433	D10
4434	K2
4435	K2
4436	F17
4500	F2
4612	K3
4613	K3
4614	H2
4615	H2
4616	I2
4617	I2
4618	J2
4619	J2
4626	K2
4627	K2
4728	D8
4729	E8
4732	F3
4733	F3
4734	F3
4735	F3
4736	E5
4737	K15
4742	K16
4743	K15
4745	F17
4750	D8
4751	F8
4807	C2
4853	G2
4856	K15
4857	K15
4858	K16
4859	K15
5757	D5
6039	E17
6040	E17
6750	A17
7206	J9
7207	J9
7208	I6
7209	A12
7426	F12
7427	H16
7575	A16
7701	C3
7776	D4
7777	D6
7801	C4
F802	I2
F803	I2
F804	J2
F805	G8
F806	D15
F807	J2
F808	B15
F809	B15
F810	C15
F811	A17
F812	A17
F813	A17
F814	A17
F815	A17
F816	B17
F817	A17
F818	A17
F819	B17
F820	B17
F821	B17
F822	B17
F823	B17
F824	C17
F825	C17
F826	C17
F827	C17
F828	C17
F829	C17
F830	D17
F831	D17
F832	D17
F836	D17
F837	D17
F838	D17
F842	E15
F844	E15
F845	E17
F846	E18
F847	E17
F848	F17
F849	F17
F850	F17
F851	G17
F852	F17
F853	G17
F854	G17
F855	G17
F856	G17
F857	H17
F858	H17
F859	H17
F860	H17
F861	H17
F862	I17
F863	I17
F864	J17
F865	J17
F866	J17
F867	J17
F868	J19
F869	K19
F870	G19
F871	H19
F872	H19
F873	H19
F874	I19
F875	I19
F876	I19
F877	I19
F878	I19
F879	H12
F880	L17
F881	K16
F882	K16
F883	K16
I804	F15
I805	G15
I806	H15
I808	H7
I811	I8
I812	J8
I813	J8
I814	J7
I815	J7
I816	J5
I817	I9
I818	J9
I819	J9
I820	E6
I821	E6
I822	F17
I823	D8
I824	F8
I825	C3
I826	D3
I827	D3
I828	I4
I829	I6
I830	K5
I831	K3
I832	K3
I833	E17
I834	I15


K8
SOURCE SELECTION
(ADDITIONAL TO K1)
K1/K8
TDA8601T 1FH (RGB-SWITCH)
7209
TDA8601T 2FH (RGB-SWITCH)
7426
DECODING
SELECTABLE CLAMP
3-STATE
TEA6422D
7777
SUPPLY
BUS DECODER
7776
LOGIC
7208
TEA6415CD-TR
SWITCH
TO 0351
M2
TO 0352
M2
TO 0353
M2
PIP FDS
TO 0361
L1
TO 0362
L1
FROM/TO
L
FBX
NC.
FROM/TO AV371 OF
AV4
FROM/TO AV372 OF
AV7
FROM/TO AV373 OF
AV8
U-I
NOT USED
TO 0312 of
V1
NOT USED
FOR AP-TOP CONNECT 2250 TO SC1-C-IN
8204 000 81009
CL 36532030_012.eps
030403
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J
K
L

Layout Small Signal Board (Overview Top Side)

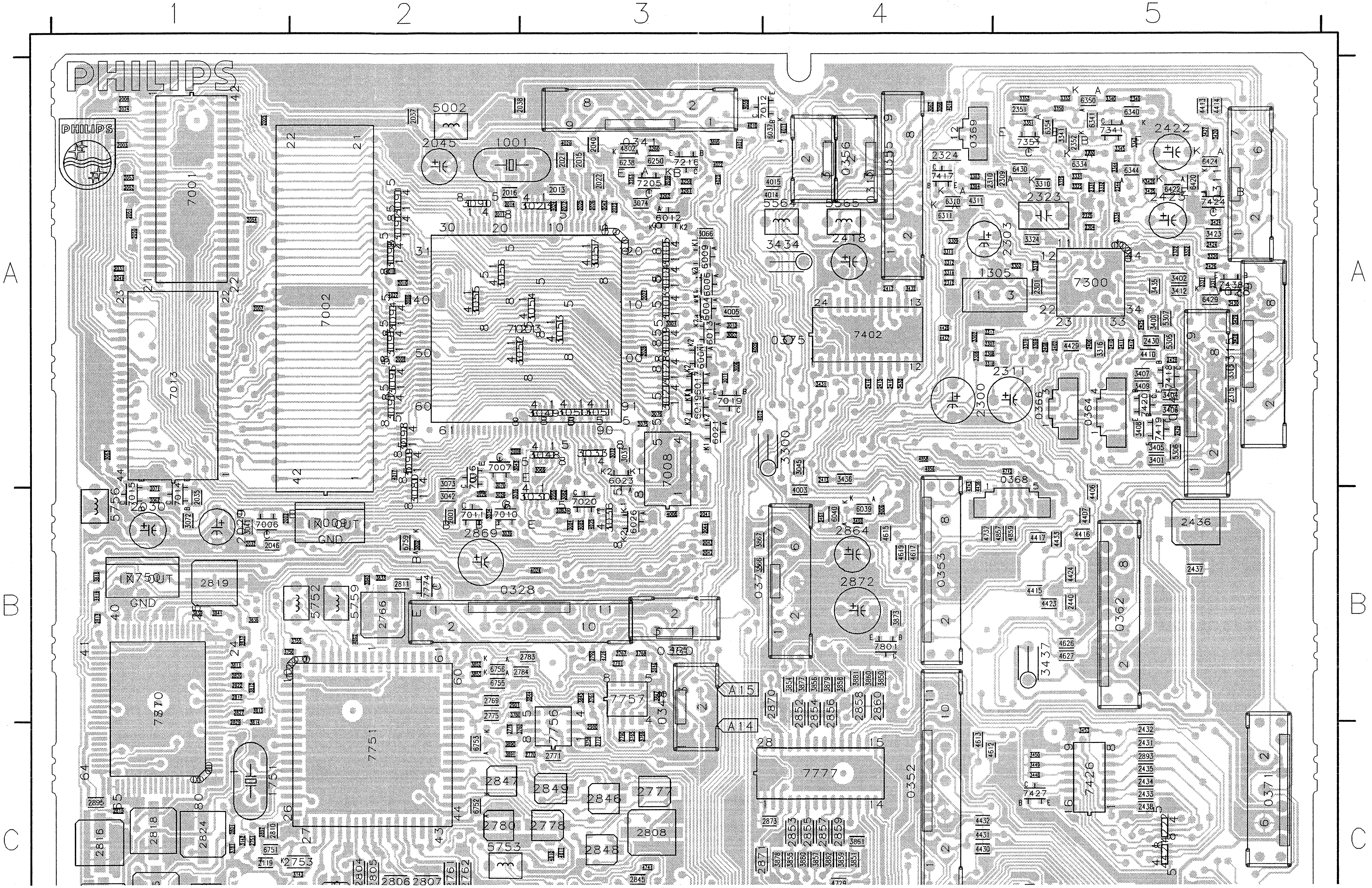


3104 303 37046

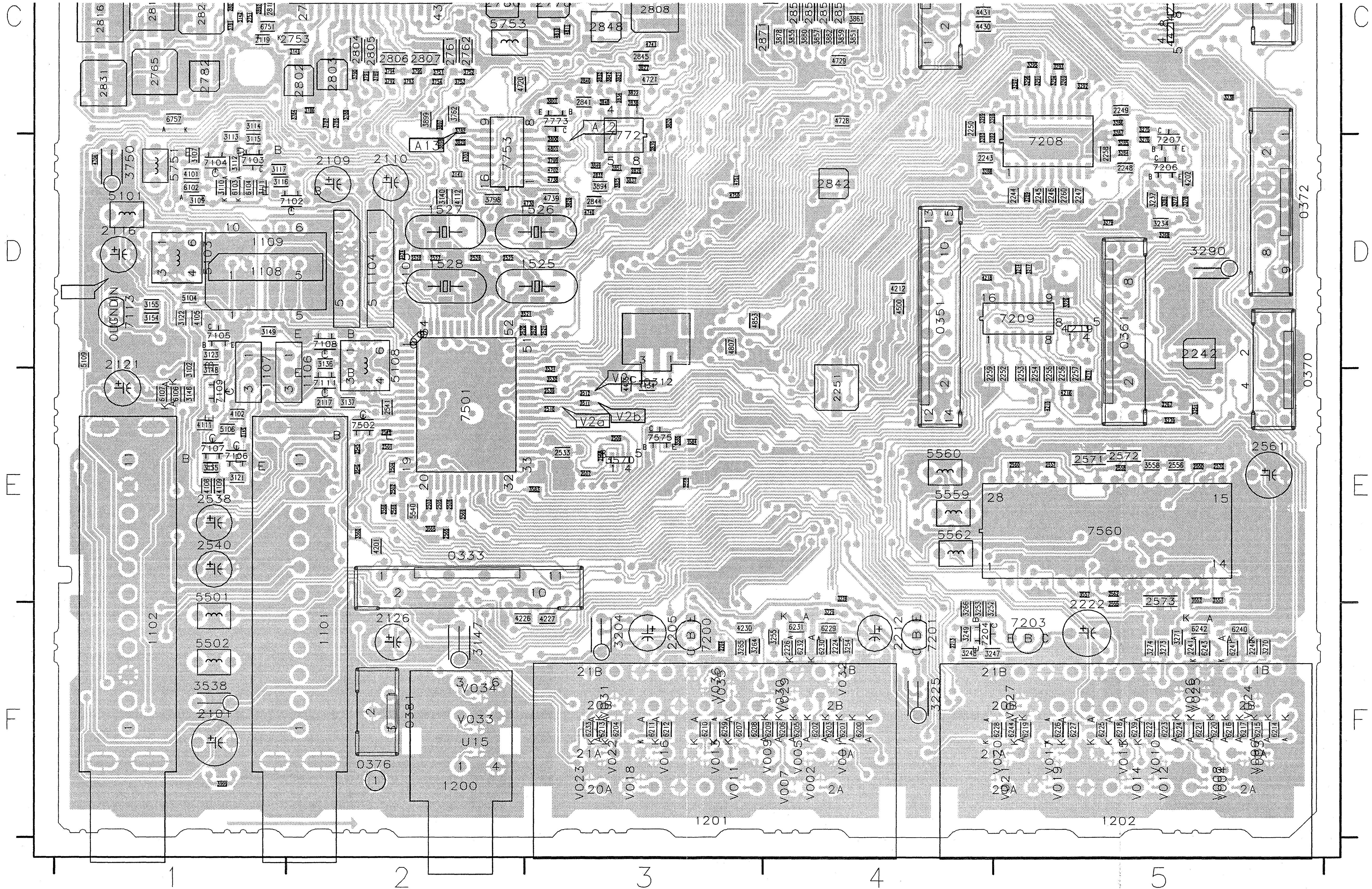
CL 36532030_001.eps
030403

0310	A4
0311	A5
0312	D3
0315	A5
0328	B2
0333	E2
0340	A5
0341	A3
0344	C3
0348	B3
0351	D4
0352	C4
0353	B4
0355	A4
0356	A4
0360	B3
0361	D5
0362	B5
0364	A5
0366	A5
0368	B5
0369	A4
0370	E5
0371	C5
0372	D5
0373	B4
0375	A4
0376	F2
0381	F2
1001	A2
1101	F1
1102	F1
1104	D2
1105	D2
1106	D2
1107	D1
1108	D1
1109	D1
1200	F2
1201	F3
1202	F5
1305	A4
1525	D3
1526	D2
1527	D2
1528	D2
1751	C1
2001	B2
2002	B1
2003	A1
2005	A1
2006	A1
2007	A1
2008	A2
2009	A2
2010	A2
2011	A2
2012	A3
2013	A3
2014	A2
2015	A3
2016	A2
2021	A3
2022	A3
2023	A3
2024	A1
2025	A3
2026	A3
2027	A3
2028	A3
2029	B1
2030	B1
2031	A1
2032	B1
2035	B1
2037	A2
2038	A2
2039	A3
2040	A3
2041	B3
2042	B3
2043	B3
2044	B3
2045	A2
2046	B1
2049	A1
2050	A1
2051	A1
2052	A1
2053	A1
2054	A1
2055	B3
2101	F1
2109	D2
2110	D2
2116	D1
2117	E2
2119	C1
2121	D1
2126	F2
2204	F3
2205	F3
2212	F4
2213	F4
2222	F5
2224	F4
2226	F4
2240	F5
2241	F5
2242	D5
2243	D4
2244	D5
2245	D5
2246	D5
2247	D5
2248	D5
2249	C5
2250	C4
2251	D4
2252	E5
2253	E5
2254	E5
2255	E5
2256	E5
2257	E5
2258	D5
2259	E4
2260	D5
2300	A4
2301	A5
2303	A5
2304	A5
2307	A4
2308	A4
2309	A5
2310	A4
2311	A5
2312	A4
2315	A5
2321	A5
2322	A5
2323	A5
2324	A4
2325	A5
2331	A5
2340	A5
2344	A5
2351	A5
2352	A5
2406	A5
2407	A5
2408	A5
2410	A5
2411	A5
2412	A5
2413	A4
2414	A4
2415	A4
2416	A4
2417	A4
2418	A4
2422	A5
2423	A5
2424	A5
2425	A5
2426	A5
2428	A5
2429	A5
2430	A5
2431	C5
2432	C5
2433	C5
2434	C5
2435	C5
2436	B5
2437	B5
2438	C5
2440	B5
2501	E2
2502	E2
2503	E2
2504	E2
2505	E2
2506	E2
2507	E3
2508	E3
2509	E3
2510	E3
2511	E3
2512	E3
2520	D2
2521	D3
2522	D3
2525	D2
2526	D2
2527	D2
2528	D2
2533	E3
2538	E1
2539	E3
2540	E1
2541	E2
2545	E2
2550	E5
2555	F5
2556	E5
2557	E5
2558	E5
2560	E5
2561	E5
2562	E5
2565	E2
2566	E2
2568	E3
2570	E5
2571	E5
2572	E5
2573	F5
2751	C1
2753	C2
2761	C2
2762	C2
2765	C1
2766	B2
2769	B2
2770	C3
2771	C3
2772	C3
2775	B2
2776	C2
2777	C3
2778	C3
2780	C2
2782	C1
2783	B3
2784	B3
2790	C3
2791	B3
2792	B3
2801	C1
2802	C1
2803	C2
2804	C2
2805	C2
2806	C2
2807	C2
2808	C3
2810	C1
2811	B2
2813	B1
2815	C1
2816	C1
2817	B1
2818	C1
2819	B1
2820	B1
2822	B1
2824	C1
2826	D3
2827	B1
2829	C1
2831	C1
2832	C3
2833	D3
2834	C3
2837	B1
2838	C3
2839	D3
2840	C3
2841	C3
2842	D4
2844	D3
2845	C3
2846	C3
2847	C2
2848	C3
2849	C3
2851	D3
2852	C4
2853	C4
2854	C4
2855	C4
2856	B4
2857	C4
2858	B4
2859	C4
2860	B4
2864	B4
2869	B2
2870	B3
2871	C3
2872	B4
2873	C4
2893	C5
2895	C1
2897	C1
2900	C3
2901	B2
3001	A3
3003	A3
3004	A3
3005	A3
3006	A3
3007	A3
3009	A3
3010	A3
3011	A3
3023	A3
3024	A3
3026	B2
3027	A3
3028	A3
3029	B2
3030	A3
3031	A3
3032	A3
3033	A3
3034	B2
3035	B2
3036	B3
3039	B2
3041	B1
3042	B2
3043	A2
3045	A4
3047	A3
3048	A3
3049	A3
3050	A3
3051	A3
3052	A3
3053	A3
3054	A2
3055	A2
3056	A2
3057	A3
3059	A3
3062	B1
3063	A1
3066	A3
3067	A4
3068	A4
3069	A3
3070	A2
3071	B1
3072	B1
3073	A2
3074	A3
3075	A3
3076	A3
3080	B2
3082	B3
3083	B3
3084	B3
3085	B3
3086	A2
3090	A2
3091	A2
3092	A2
3093	A2
3094	A2
3095	A2
3096	A2
3097	A2
3098	A2
3099	A2
3102	E1
3107	D1
3109	D1
3110	D1
3111	D1
3112	D1
3113	D1
3114	C1
3115	D1
3116	D1
3117	D1
3121	E1
3122	D1
3123	D1
3124	D2
3135	E1
3136	D2
3137	E2
3140	D2
3141	D2
3142	C1
3143	C2
3145	E1
3146	E1
3147	F2
3148	E1
3149	D1
3154	D1
3155	D1
3204	F3
3214	D5
3217	D5
3225	F4
3226	D5
3228	E4
3229	F4
3234	D5
3237	D5
3238	C5
3239	E5
3247	F4
3248	F4
3249	F4
3251	E5
3252	F4
3253	F4
3254	F4
3255	F4
3259	A3
3260	A3
3261	A3
3262	A3
3263	A3
3264	F3
3265	F3
3266	F4
3267	E5
3268	D5
3269	C5
3270	F5
3271	F5
3273	F5
3274	F5
3275	C5
3276	D5
3277	D5
3278	D5
3279	D5
3281	D5
3282	D4
3283	D4
3284	D5
3285	D5
3286	C5
3287	C5
3288	D4
3289	D5
3290	D5
3291	C5
3292	C5
3293	C5
3294	C5
3295	C5
3296	C5
3297	C5
3298	C4
3299	C4
3300	A3
3302	A5
3303	A4
3304	A4
3307	A4
3308	A4
3309	A4
3310	A5
3311	A4
3312	A4
3313	A5
3314	A4
3315	A5
3316	A5
3317	A4
3318	A4
3320	A5
3321	A5
3322	A5
3324	A5
3325	A5
3326	A5
3330	A5
3331	A5
3332	A5
3334	A5
3340	A5
3341	A5
3342	A5
3344	A5
3345	A5
3350	A5
3351	A5
3352	A5
3353	A5
3369	A5
3370	A5
3400	A5
3401	A5
3402	A5
3404	A5
3405	A5
3406	A5
3407	A5
3408	A5
3409	A5
3412	A5
3420	A5
3423	A5
3424	A5
3425	A5
3426	A5
3427	A5
3428	A5
3429	A5
3430	A5
3431	A4
3432	A4
3433	A4
3434	A4
3435	A5
3436	A4
3437	B5
3448	C5
3449	C5
3450	C5
3453	C5
3460	B4
3461	B4
3521	D3
3530	E3
3531	E3
3538	F1
3545	E2
3546	E2
3551	E5
3552	E5
3557	E5
3558	E5
3560	E2
3565	E2
3566	E2
3569	E2
3570	E3
3583	E3
3584	E3
3585	E3
3750	C1
3751	C2
3752	C2
3753	C2
3754	C2
3755	B2
3756	B1
3758	C3
3760	C2
3761	B3
3762	C2
3765	C3
3766	C3
3767	B3
3768	B3
3780	B2
3781	C1
3782	C2
3784	C2
3785	C2
3786	C2
3787	C2
3788	C2
3789	C2
3790	C2
3791	C2
3792	C2
3793	C2
3794	C2
3795	C2
3798	D2
3799	D3
3800	D3
3801	C3
3802	B2
3811	B1
3812	B1
3813	B1
3814	C1
3818	B1
3819	B1
3820	C3
3821	C3
3822	C3
3825	D3
3827	C3
3828	D3
3829	D2
3833	B2
3837	D3
3838	B1
3839	B1
3840	B2
3841	B1
3842	C3
3844	B3
3845	B3
3846	B3
3847	B3
3848	C3
3849	D3
3850	B4
3851	C4
3852	B2
3853	B2
3854	B4
3855	C4
3856	B4
3857	C4
3858	B4
3859	C4
3860	B4
3861	C4
3866	B3
3867	B3
3873	B4
3877	B4
3878	C4
3879	B4
3880	C4
3881	B4
3882	C4
3890	C2
3891	C2
3894	D3
3895	A3
3897	C2
3898	D2
3899	C2
3999	F1
4003	B4
4005	A3
4006	B4
4008	B3
4009	A3
4010	A3
4011	A4
4012	A3
4014	A4
4015	A4
4017	A2
4018	A2
4019	A4
4021	A3
4022	A3
4023	A3
4024	B3
4025	B3
4027	A2
4029	A3
4101	D1
4102	E1
4105	D1
4108	E1
4109	E1
4111	E1
4112	D2
4201	E2
4202	D5
4212	D4
4215	E5
4216	E5
4217	E5
4218	D4
4219	D5
4222	C5
4226	F2
4227	F3
4230	F3
4311	A4
4406	B5
4407	B5
4410	A5
4413	A5
4414	A5
4415	B5
4416	B5
4417	B5
4421	C5
4423	B5
4424	B5
4426	A4
4427	A4
4429	A5
4430	C4
4431	C4
4432	C4
4433	B5
4434	E3
4435	E3
4436	A4
4500	D4
4612	C4
4613	C4
4615	B4
4617	B4
4619	B4
4626	B5
4627	B5
4702	D3
4703	D2
4704	D1
4720	C2
4721	C3
4725	B3
4726	B3
4728	C4
4729	C4
4730	D3
4737	B4
4738	D3
4739	D3
4740	D3
4741	C3
4742	A5
4743	A4
4750	D3
4751	D3
4801	D3
4802	A3
4807	D3
4810	C3
4811	C3
4853	D3
4856	A4
4857	B5
4858	A4
4859	B5
4862	B2
5002	A2
5101	D1
5103	D1
5104	D1
5106	E1
5108	D2
5109	D1
5305	A5
5306	A5
5307	A5
5501	E1
5502	F1
5540	E2
5559	E4
5560	E4
5562	E4
5564	A4
5565	A4
5751	D1
5752	B1
5753	C3
5756	B1
5759	B2
6001	A3
6004	A3
6006	A3
6009	A3
6012	A3
6013	A3
6017	A3
6019	A3
6021	A3
6023	A3
6026	B3
6037	A4
6039	B4
6040	B4
6102	D1
6103	D1
6104	D1
6106	D1
6107	D1
6200	F4
6201	F4
6202	F4
6203	F4
6204	F3
6205	F4
6206	F4
6207	F3
6208	F3
6209	F4
6210	F3
6211	F3
6212	F3
6213	F3
6214	F5
6215	F5
6216	F5
6217	F5
6218	F5
6219	F5
6220	F5
6221	F5
6222	F5
6223	F5
6224	F5
6225	F5
6226	F5
6227	F5
6228	F4
6229	F4
6230	F4
6231	F4
6232	F4
6233	F3
6238	A3
6239	F5
6240	F5
6241	F5
6242	F5
6243	F5
6244	F5
6250	A3
6259	F3
6310	A4
6311	A4
6334	A5
6340	A5
6341	A5
6344	A5
6350	A5
6354	A5
6420	A5
6422	A5
6424	A5
6429	A5
6430	A5
6751	C1
6752	C2
6753	C2
6755	B2
6756	B2
6757	C1
6759	B2
7001	A1
7002	A1
7003	A2
7006	B1
7007	A2
7008	A3
7009	B2
7010	B3
7011	B2
7012	A4
7013	A1
7014	B1
7015	B1
7016	A2
7019	A3
7020	B3
7102	D2
7103	D1
7104	D1
7105	D1
7106	E1
7107	E1
7108	D2
7109	E1
7111	E2
7113	D1
7200	F3
7201	F4
7203	F5
7204	F5
7205	A3
7206	D5
7207	C5
7208	C5
7209	D4
7216	A3
7300	A5
7341	A5
7351	A5
7402	A4
7417	A4
7418	A5
7419	A5
7420	A5
7424	A5
7426	C5
7427	C5
7438	A5
7501	D2
7502	E2
7560	E5
7575	E3
7750	B1
7751	B2
7753	C2
7756	B3
7757	B3
7770	B1
7772	D3
7773	C3
7774	B2
7777	C4
7801	B4

Layout Small Signal Board (Part 1 Top Side)

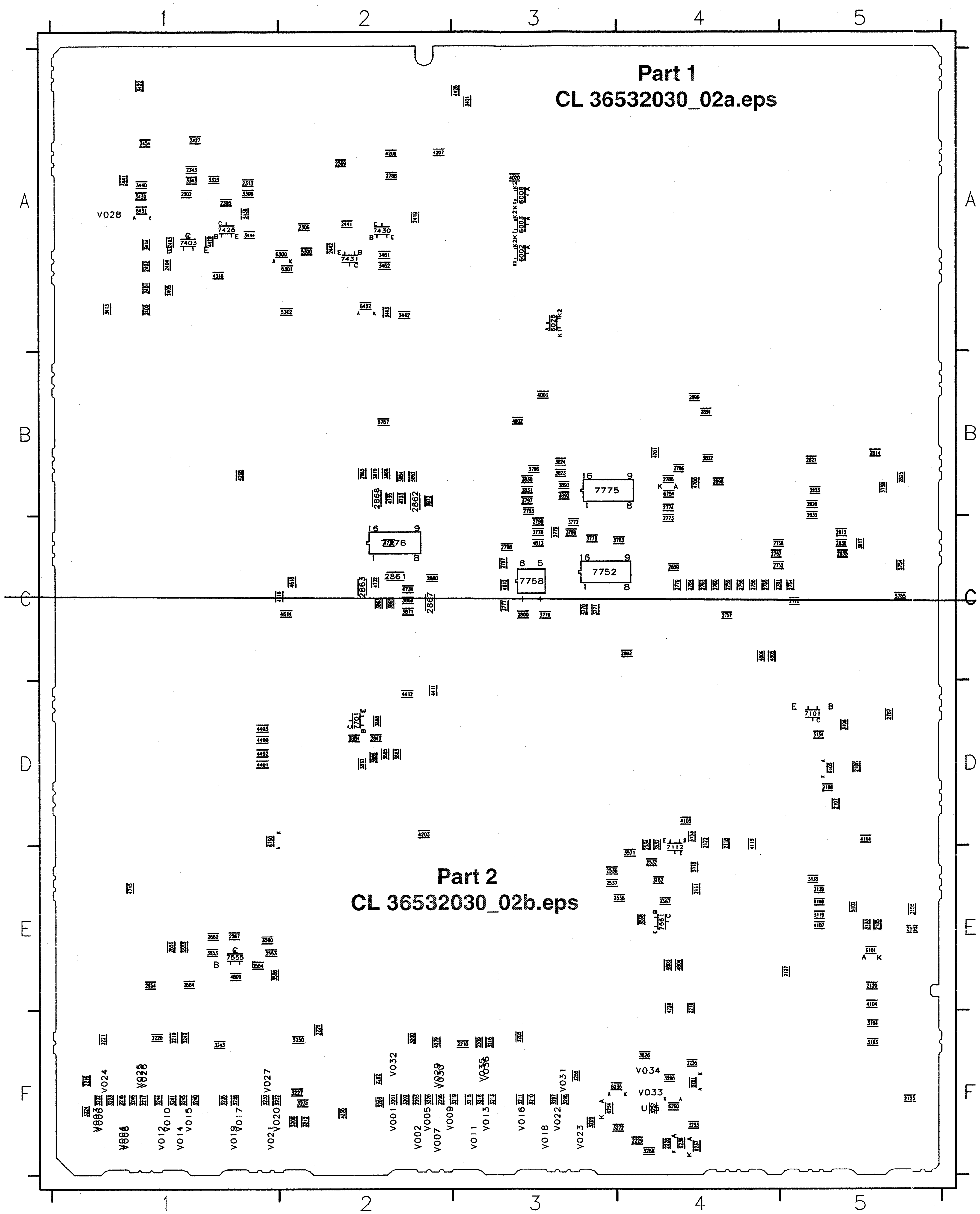

1
2
3
4
5
A
B
C
PHILIPS
7001
7002
7013
7003
7008
7300
7402
7426
7751
7757
7756
7777
7870
1001
1305
1751
0328
0335
0352
0353
0356
0362
0366
0364
0368
0369
0371
0375
0377
0340
5002
5752
5759
5753
2045
2418
2422
2423
2300
2311
2323
2324
2303
2436
2437
2766
2777
2778
2780
2808
2816
2818
2819
2824
2846
2847
2848
2849
2864
2869
2872
3300
3434
3437
A15
A14
GND
OUT
IN

Layout Small Signal Board (Part 2 Top Side)


C
D
E
F
1
2
3
4
5
2816
2831
2765
2782
2802
2803
2804
2805
2806
2807
2761
2762
5753
2848
2808
2845
4721
2841
7773
7772
7753
A1
A2
3750
5751
5101
2116
1109
1108
5103
1104
1527
1526
1528
1525
2109
2110
7104
7103
7102
7113
2121
7105
7108
1107
1106
5108
7111
2117
7501
7502
7107
7106
2538
2540
5501
5502
3538
2101
1102
1101
0333
2126
3147
0381
0376
1200
V034
V033
U15
3204
2205
7200
2212
7201
3225
1201
1202
2842
2251
0351
7208
7207
7206
7209
0361
0372
0370
3290
2242
2561
5560
5559
5562
7560
2571
2572
2573
2222
7203
7575
7570
V2a
V2b
21B
20B
21A
20A
2B
2A
1B

CL 36532030_01b.eps
020403

Layout Small Signal Board (Overview Bottom Side)

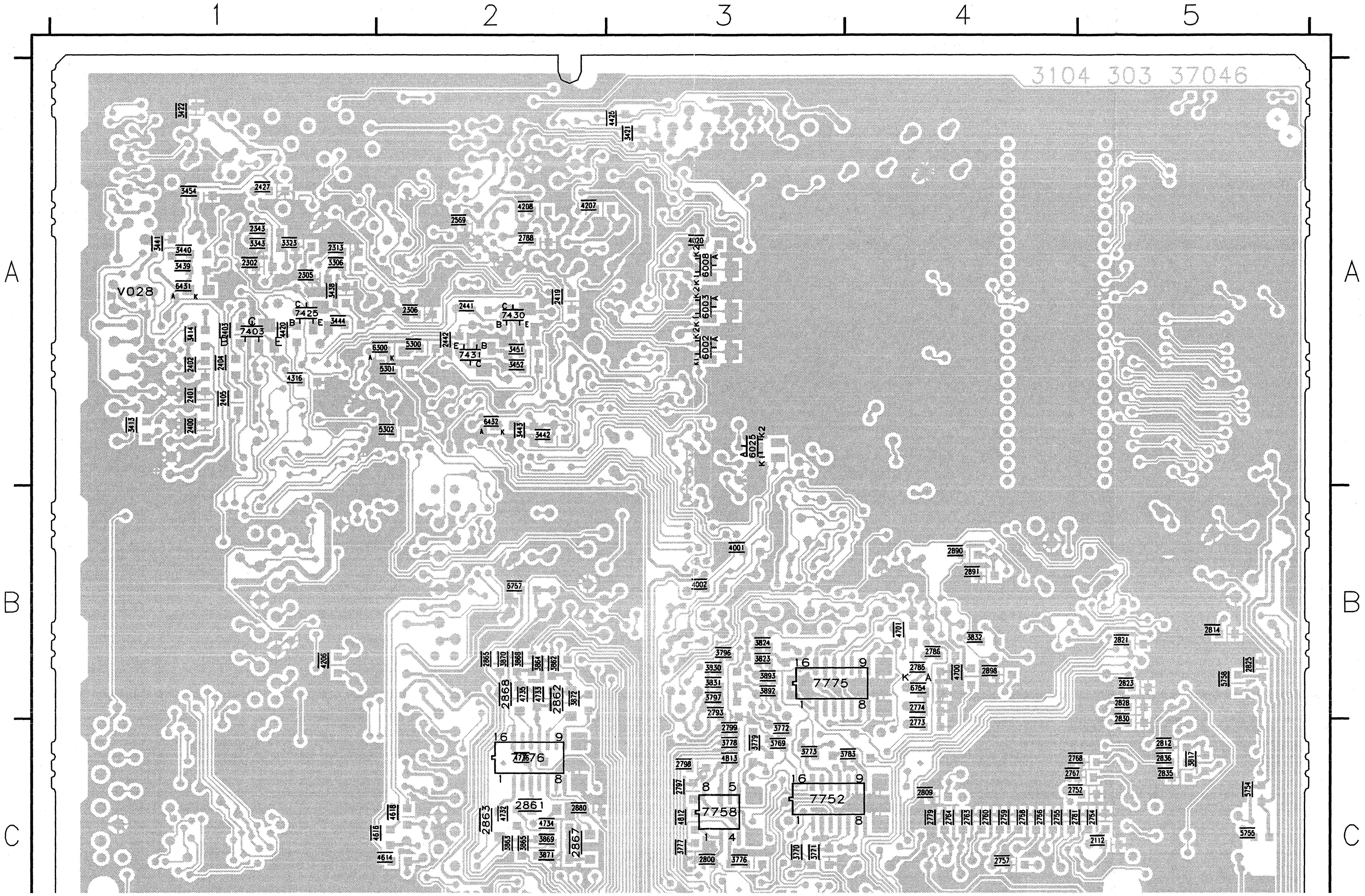


3104 303 37046

CL 36532030_002.eps
030403

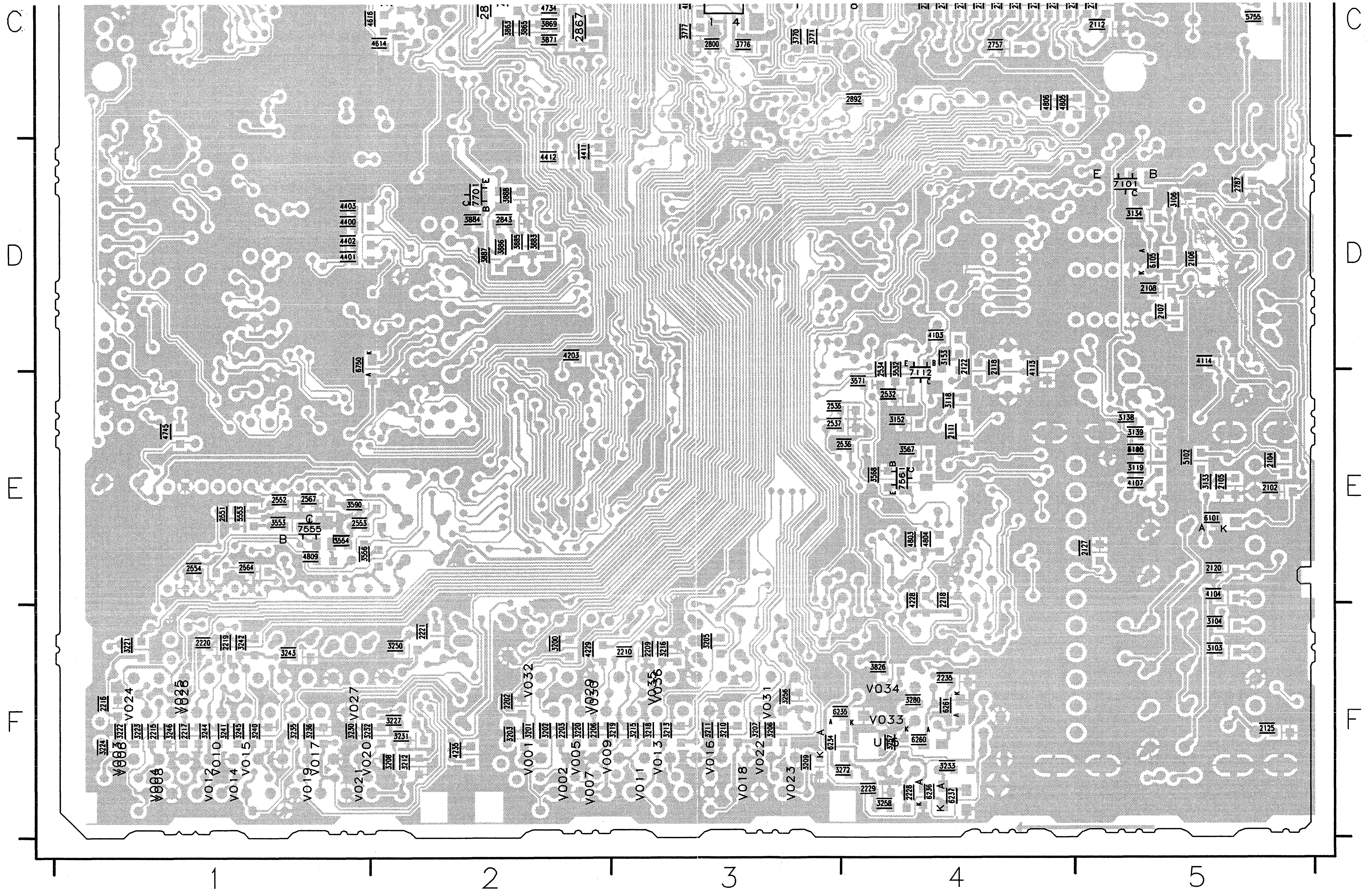
0310	A2
0311	A1
0315	A1
0328	B3
0333	E4
0340	A1
0341	A3
0344	B3
0348	C3
0351	D2
0352	C2
0353	B2
0355	A2
0356	A2
0360	B3
0361	D1
0362	B1
0370	E1
0371	C1
0372	D1
0373	B3
0375	A2
0376	F4
0381	F4
1001	A4
1101	E4
1102	E5
1104	D4
1105	D4
1106	E4
1107	E5
1108	D5
1109	D4
1200	F4
1201	F3
1202	F1
1305	A2
1525	D4
1526	D3
1527	D4
1528	D4
1751	C5
2029	B5
2030	B5
2045	A4
2101	F5
2102	E5
2104	E5
2105	E5
2106	D5
2107	D5
2108	D5
2109	D4
2110	D4
2111	E4
2112	C5
2116	D5
2118	D4
2120	E5
2121	D5
2122	D4
2125	F5
2126	F4
2127	E5
2202	F2
2203	F2
2205	F3
2206	F2
2209	F3
2210	F3
2212	F2
2215	F1
2216	F1
2217	F1
2218	E4
2219	F1
2220	F1
2221	F2
2222	F1
2228	F4
2229	F4
2235	F4
2300	A2
2302	A1
2303	A2
2305	A1
2306	A2
2311	A1
2313	A1
2323	A1
2343	A1
2400	A1
2401	A1
2402	A1
2403	A1
2404	A1
2405	A1
2418	A2
2419	A2
2422	A1
2423	A1
2427	A1
2441	A2
2442	A2
2532	E4
2534	D4
2535	E3
2536	E4
2537	E3
2538	E5
2540	E5
2551	E1
2552	E1
2553	E1
2554	E1
2561	E1
2564	E1
2567	E1
2569	A2
2752	C4
2754	C5
2755	C4
2756	C4
2757	C4
2758	C4
2759	C4
2760	C4
2763	C4
2764	C4
2767	C4
2768	C4
2773	C4
2774	B4
2779	C4
2781	C4
2785	B4
2786	B4
2787	D5
2788	A2
2793	B3
2797	C3
2798	C3
2799	C3
2800	C3
2809	C4
2812	C5
2814	B5
2821	B5
2823	B5
2825	B5
2828	B5
2830	C5
2835	C5
2836	C5
2843	D2
2861	C2
2862	B2
2863	C2
2864	B2
2865	B2
2867	C2
2868	B2
2869	B4
2872	B2
2880	C2
2890	B4
2891	B4
2892	C4
2898	B4
3103	F5
3104	F5
3106	D5
3118	E4
3119	E5
3133	E5
3134	D5
3138	E5
3139	E5
3147	F4
3152	E4
3153	D4
3200	F2
3201	F2
3202	F2
3203	F2
3204	F3
3205	F3
3206	F3
3207	F3
3208	F2
3209	F3
3210	F3
3211	F3
3212	F2
3213	F3
3215	F3
3216	F3
3218	F3
3219	F3
3220	F2
3221	F1
3222	F1
3223	F1
3224	F1
3225	F2
3227	F2
3230	F1
3231	F2
3232	F1
3233	F4
3235	F1
3236	F1
3240	F1
3241	F1
3242	F1
3243	F1
3244	F1
3245	F1
3246	F1
3250	F2
3256	F3
3257	F4
3258	F4
3272	F4
3280	F4
3290	D1
3300	A3
3306	A1
3323	A1
3343	A1
3413	A1
3414	A1
3421	A3
3422	A1
3434	A3
3437	B1
3438	A1
3439	A1
3440	A1
3441	A1
3442	A2
3443	A2
3444	A1
3451	A2
3452	A2
3454	A1
3532	D4
3538	F5
3553	E1
3554	E1
3556	E1
3567	E4
3568	E4
3571	E4
3590	E1
3750	D5
3769	C3
3770	C3
3771	C3
3772	C3
3773	C3
3776	C3
3777	C3
3778	C3
3779	C3
3783	C4
3796	B3
3797	B3
3817	C5
3823	B3
3824	B3
3826	F4
3830	B3
3831	B3
3832	B4
3862	B2
3863	C2
3864	B2
3865	C2
3868	B2
3869	C2
3870	B2
3871	C2
3872	B2
3883	D2
3884	D2
3885	D2
3886	D2
3887	D2
3888	D2
3892	B3
3893	B3
4001	B3
4002	B3
4020	A3
4103	D4
4104	E5
4107	E5
4110	E5
4113	D4
4114	D5
4203	D2
4206	B1
4207	A2
4208	A2
4228	E4
4229	F2
4235	F2
4316	A1
4400	D1
4401	D1
4402	D1
4403	D1
4411	D2
4412	D2
4420	A1
4425	A3
4614	C2
4616	C2
4618	C2
4700	B4
4701	B4
4732	C2
4733	B2
4734	C2
4735	B2
4736	C2
4745	E1
4803	E4
4804	E4
4805	C4
4806	C4
4809	E1
4812	C3
4813	C3
5002	A4
5101	D5
5102	E5
5103	D5
5105	E5
5108	E4
5300	A2
5301	A2
5302	A2
5501	F5
5502	F5
5553	E1
5559	E2
5560	E2
5562	E2
5564	A2
5565	A2
5751	D5
5752	B4
5753	C4
5754	C5
5755	C5
5756	B5
5757	B2
5758	B5
5759	B4
6002	A3
6003	A3
6008	A3
6025	A3
6101	E5
6105	D5
6234	F3
6235	F3
6236	F4
6237	F4
6260	F4
6261	F4
6300	A2
6431	A1
6432	A2
6750	D1
6754	B4
7002	A4
7008	A3
7009	B4
7101	D5
7112	D4
7113	D5
7200	F3
7201	F2
7203	F1
7403	A1
7425	A1
7430	A2
7431	A2
7555	E1
7560	E1
7561	E4
7701	D2
7750	B5
7752	C3
7758	C3
7775	B3
7776	C2

Layout Small Signal Board (Part 1 Bottom Side)


1
2
3
4
5
A
B
C
3104 303 37046
3422
4426
3421
3454
2427
4208
4207
2569
2788
2343
3343
3323
2313
3306
3441
3440
3439
2302
2305
6431
V028
3438
4120
6008
6003
6002
2419
7425
7430
2441
2306
3444
3414
2403
7403
3420
6300
5300
2442
7431
3451
3452
5301
2402
2404
4316
2401
2405
3413
2400
6452
3443
3442
5302
6026
4001
2890
2891
4002
5757
4701
3832
2821
2814
4200
3865
3870
3866
3864
3862
3796
3824
3823
3830
3831
3893
3892
3797
7775
2786
2785
6754
4700
2898
2823
2828
2830
3758
2835
2868
4735
4733
2862
3872
2793
2799
3778
3779
3772
3769
3773
3783
4813
2774
2773
2812
2836
3817
7776
2798
2797
7758
7752
2768
2767
2752
2809
3754
2863
4732
2861
4734
2880
4618
4616
4614
3863
3868
3869
3871
2867
4812
3777
2800
3776
3770
3771
2757
2112
3756

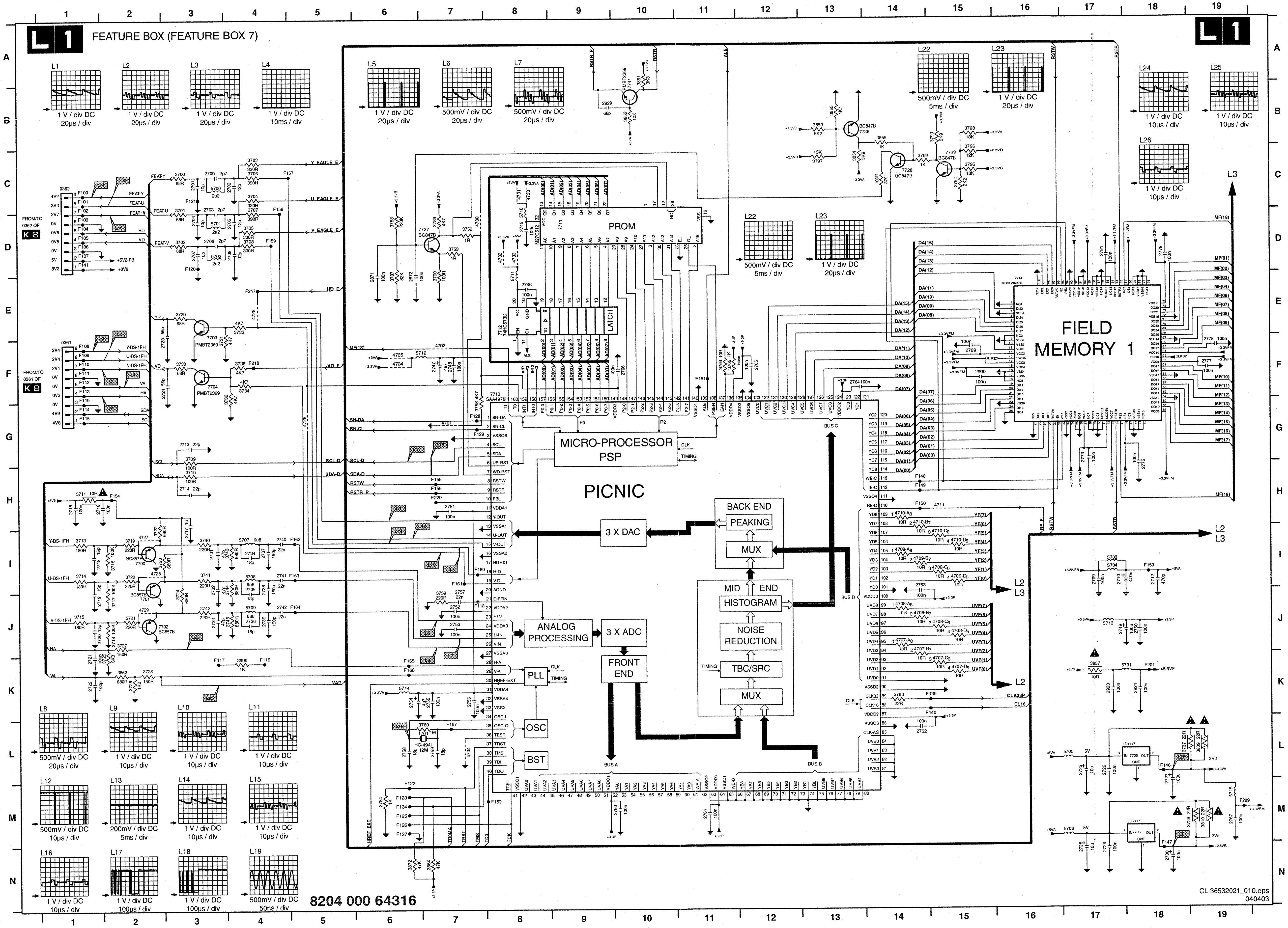
CL 36532030_02a.eps
020403

Layout Small Signal Board (Part 2 Bottom Side)


C
D
E
F
1
2
3
4
5
4616
4614
4734
3869
3871
2867
3777
2800
3776
3770
3771
2112
3755
2757
2892
4806
4805
4412
4411
7701
3888
3884
2843
3887
3886
3885
3883
4403
4400
4402
4401
7101
3134
3106
2787
6105
2106
2108
2107
4103
4203
6750
2534
3532
7112
3153
2122
2118
4113
4114
3571
2532
3118
2535
2537
3152
2111
2536
3567
7561
3568
3138
3139
6106
3119
4107
3102
3133
2105
2104
2102
6101
2551
3553
2552
2567
3590
7555
2553
3564
4809
3556
2554
2564
4803
4804
2127
2120
4104
4128
2118
3104
3103
3221
2220
2219
3242
3243
3250
2221
3200
4229
2210
2209
3216
3205
3826
2235
V034
3280
6261
V033
6235
6260
6234
3272
3233
2229
2228
6236
3258
6237
2125
V024
V025
V026
V027
V032
V029
V030
V035
V036
V031
V001
V002
V005
V007
V009
V011
V013
V016
V018
V022
V023
V003
V006
V004
V008
V010
V012
V014
V015
V017
V019
V020
V021
3227
3231
3208
3212
4235
2202
3203
3201
3202
2203
3220
2206
3219
3215
3218
3213
3211
3210
3207
3206
3209
3204
2216
3222
3223
2218
3246
2217
3244
3241
3245
3240
3239
3238
3230
3232
3224

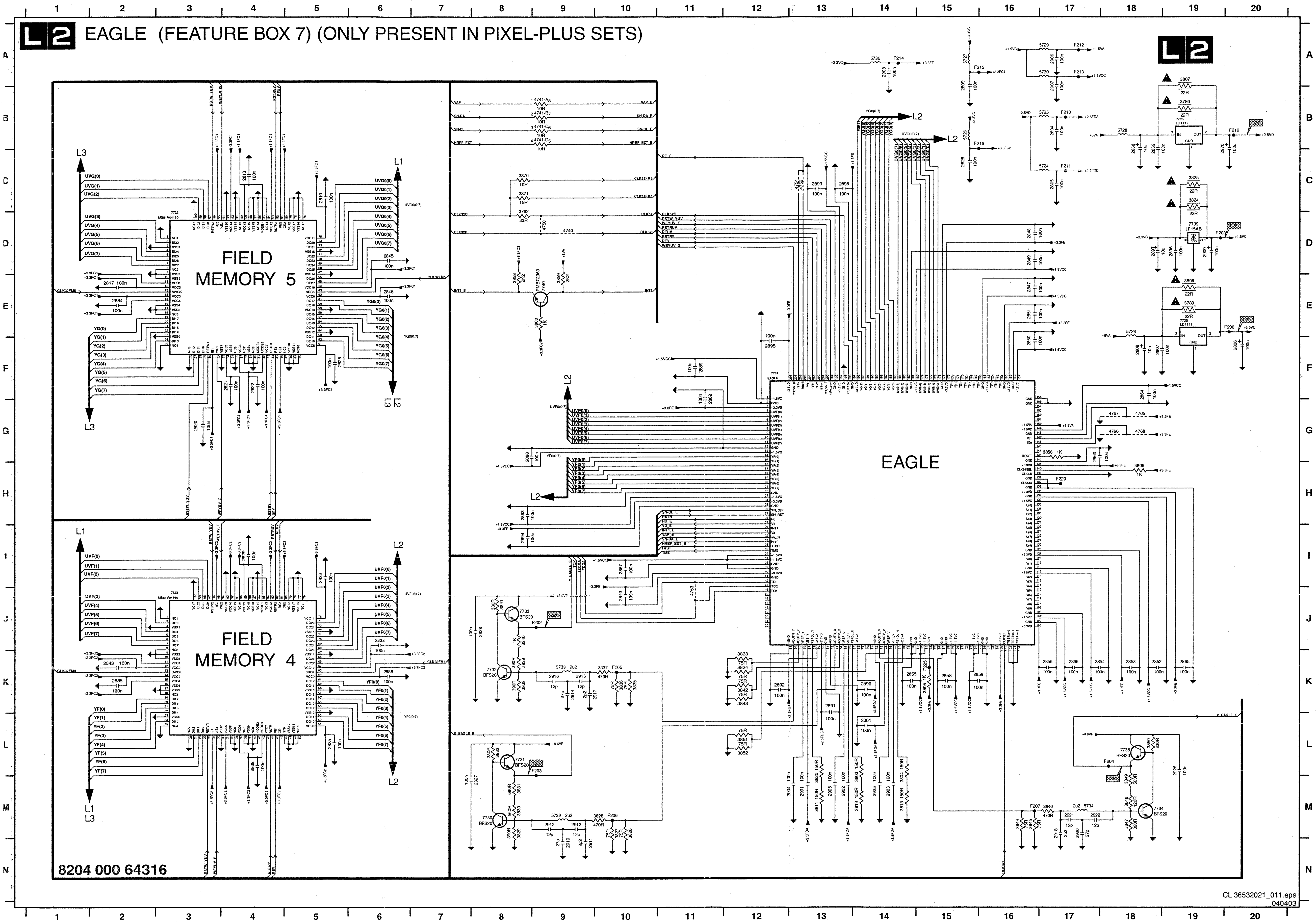
CL 36532030_02b.eps
020403

Feature Box 7 Panel: Feature Box


L1
FEATURE BOX (FEATURE BOX 7)
FROM/TO 0362 OF K8
FROM/TO 0361 OF K8
L1 1 V / div DC 20µs / div
L2 1 V / div DC 20µs / div
L3 1 V / div DC 20µs / div
L4 1 V / div DC 10ms / div
L5 1 V / div DC 20µs / div
L6 500mV / div DC 20µs / div
L7 500mV / div DC 20µs / div
L22 500mV / div DC 5ms / div
L23 1 V / div DC 20µs / div
L24 1 V / div DC 10µs / div
L25 1 V / div DC 10µs / div
L26 1 V / div DC 10µs / div
L8 500mV / div DC 20µs / div
L9 1 V / div DC 10µs / div
L10 1 V / div DC 10µs / div
L11 1 V / div DC 10µs / div
L12 500mV / div DC 10µs / div
L13 200mV / div DC 5ms / div
L14 1 V / div DC 10µs / div
L15 1 V / div DC 10µs / div
L16 1 V / div DC 10µs / div
L17 1 V / div DC 100µs / div
L18 1 V / div DC 100µs / div
L19 500mV / div DC 50ns / div
PROM
LATCH
MICRO-PROCESSOR PSP
PICNIC
3 X DAC
BACK END
PEAKING
MUX
MID END
HISTOGRAM
NOISE REDUCTION
TBC/SRC
ANALOG PROCESSING
3 X ADC
FRONT END
PLL
OSC
BST
FIELD MEMORY 1
BUS A
BUS B
BUS C
BUS D
Y EAGLE E
U EAGLE E
V EAGLE E
HD E
VD E
MF(18)
SCL-D
SDA-D
RSTW
RSTR P
VAP
L2
L3
8204 000 64316
CL 36532021_010.eps
040403

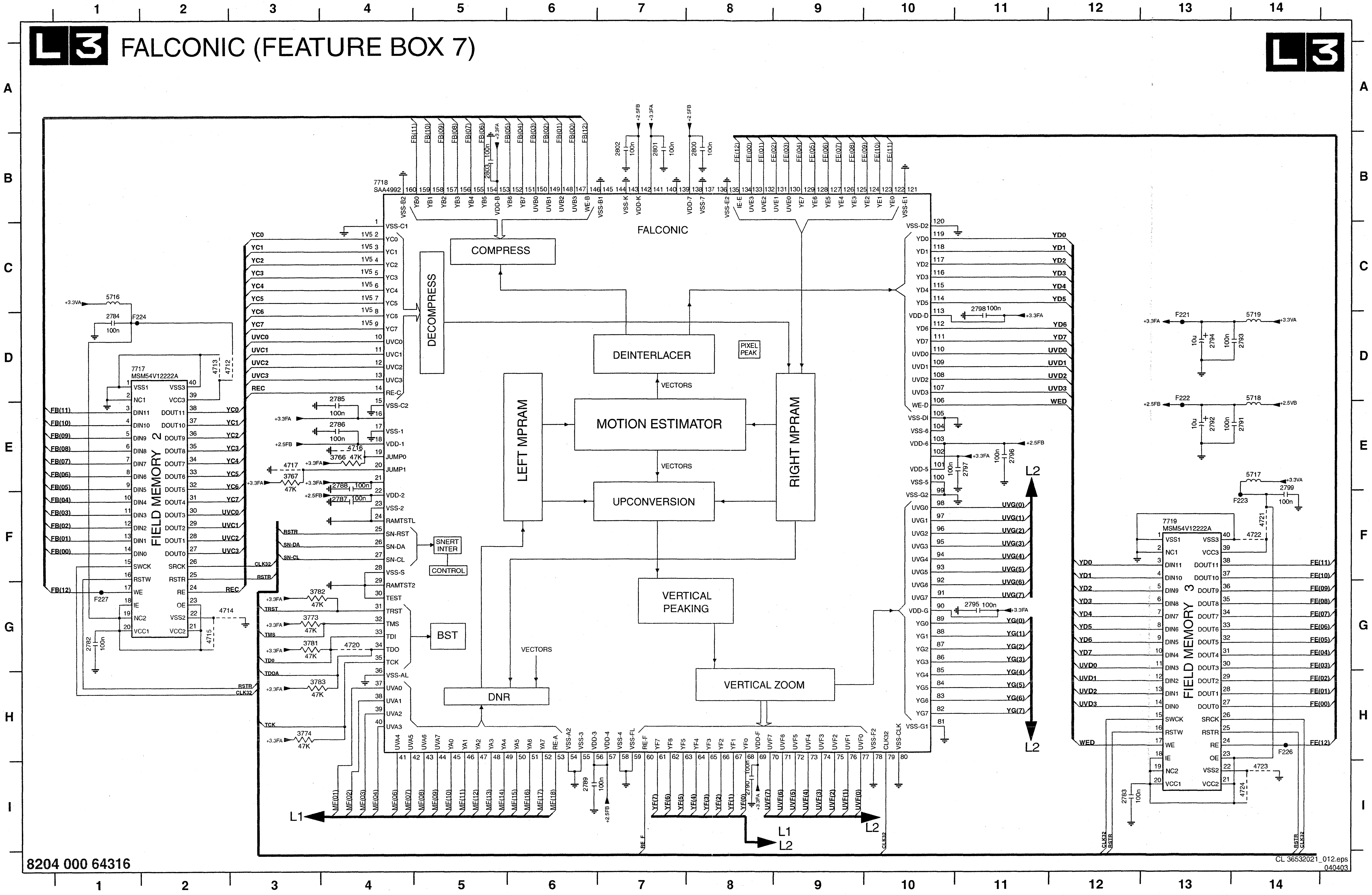
0361	E1
0362	C1
1701	L7
2700	C3
2701	C3
2702	C4
2703	C3
2704	D3
2705	D4
2706	D3
2707	D3
2708	D4
2709	I17
2710	I17
2712	I18
2713	G3
2714	H3
2715	H1
2716	H1
2717	I3
2718	I1
2719	J1
2720	J1
2721	K1
2722	K1
2723	F3
2724	F3
2725	L17
2726	L17
2727	M18
2728	N17
2729	N17
2730	N18
2731	I3
2732	I3
2733	J3
2734	I4
2735	I4
2736	J4
2737	I4
2738	I4
2739	J4
2740	I4
2741	I4
2742	J4
2745	D8
2746	E8
2747	F7
2748	F7
2749	J17
2750	J18
2751	H7
2752	J7
2753	J7
2754	K6
2755	K7
2756	K7
2757	I7
2758	L6
2759	L7
2760	M10
2761	M11
2762	L14
2763	I14
2764	F13
2765	F12
2766	F10
2767	M19
2769	F15
2773	G17
2775	H18
2777	F19
2778	F19
2779	D18
2781	D17
2871	E6
2872	E6
2900	F15
2923	K17
2924	K18
2929	B9
3700	C3
3701	C3
3702	D3
3703	C4
3704	C4
3705	D4
3706	C4
3707	C4
3708	D4
3709	G3
3710	H3
3711	H1
3713	I1
3714	I1
3715	J1
3716	I2
3717	J2
3718	J2
3719	I2
3720	I2
3721	J2
3722	I2
3723	I2
3724	J3
3725	K2
3726	K2
3727	J2
3728	K2
3729	E3
3730	F3
3731	F3
3732	F4
3733	E4
3734	F4
3735	F4
3737	L18
3739	M18
3740	I3
3741	I3
3742	J3
3743	I4
3744	I4
3745	J4
3752	D7
3753	D7
3758	G7
3759	I7
3760	L7
3763	K14
3764	F11
3765	F11
3784	M6
3787	E6
3788	D6
3789	D7
3790	E7
3791	C14
3792	C14
3793	B15
3794	C15
3795	C15
3796	C15
3797	C13
3798	B15
3809	L19
3810	M19
3853	B13
3854	C13
3855	B14
3857	K17
3861	A10
3862	B10
3863	K2
3864	N7
3865	B13
3872	N6
3999	M2
4700	D7
4701	G7
4702	F7
4704	L7
4707-A	J14
4707-B	J14
4707-C	K15
4707-D	K15
4708-A	J14
4708-B	J14
4708-C	J15
4708-D	J15
4709-A	I14
4709-B	I14
4709-C	I15
4709-D	I15
4710-A	H14
4710-B	H14
4710-C	I15
4710-D	I15
4711	H15
4725	E4
4726	G5
4727	I2
4728	I2
4729	J2
4730	C8
4731	C8
4732	D8
4733	D8
4734	F6
4735	F6
5700	C3
5701	D3
5702	D3
5703	I17
5704	I17
5705	L17
5706	M17
5707	I4
5708	I4
5709	J4
5710	D8
5711	E8
5712	F7
5713	J17
5714	K6
5715	M19
5731	K18
7700	I2
7701	J2
7702	J2
7703	E3
7704	F3
7705	L18
7706	M18
7711	D9
7712	E8
7713	F8
7714	E16
7727	D6
7728	C14
7729	C15
7736	B13
7741	A10
F100	C1
F101	C1
F102	C1
F103	D1
F104	D1
F105	D1
F106	D1
F107	D1
F108	F1
F109	F1
F110	F1
F111	F1
F112	F1
F113	F1
F114	G1
F115	G1
F116	M2
F117	M1
F118	J7
F119	F1
F120	D3
F121	C3
F122	M6
F123	M6
F124	M6
F125	M6
F126	M6
F127	M6
F128	G7
F129	G7
F139	K15
F140	K15
F141	D1
F146	L18
F147	N18
F148	H14
F149	H14
F150	H14
F151	F11
F152	M8
F153	I18
F154	H2
F155	H7
F156	H7
F157	C5
F158	C4
F159	D4
F160	I7
F161	I7
F162	I5
F163	I5
F164	J5
F165	K6
F166	K6
F167	L7
F201	K18
F209	M19
F217	E4
F218	F4
F229	H7

Feature Box 7 Panel: Eagle



2804	B17
2805	C17
2806	F20
2807	F18
2808	F18
2809	A15
2810	C5
2813	C4
2817	E2
2820	G3
2821	F4
2822	F4
2825	F5
2826	C15
2829	I4
2832	I5
2833	J6
2835	L5
2838	L4
2843	K2
2845	D6
2846	E6
2847	E16
2848	D16
2849	D16
2850	F16
2851	E16
2852	K18
2853	K18
2854	K17
2855	K14
2856	K17
2858	K15
2859	K15
2860	G17
2861	L14
2862	F11
2863	H8
2864	F18
2865	K19
2866	K17
2867	I10
2868	B18
2869	B18
2870	B19
2884	E2
2885	K2
2886	K6
2888	G8
2889	F11
2890	K14
2891	K13
2892	K12
2893	J10
2894	I8
2895	F12
2896	D19
2897	D18
2898	C13
2899	C13
2901	M13
2902	M13
2903	M14
2904	M13
2905	M13
2906	A17
2907	A17
2908	A14
2909	D19
2910	N9
2911	N9
2912	M9
2913	M9
2914	K9
2915	K9
2916	K9
2917	K9
2918	M17
2920	M17
2921	M17
2922	M17
2925	M14
2926	L19
2927	M8
2928	J8
3762	D8
3780	E19
3786	B19
3803	M14
3804	M14
3805	K15
3806	H18
3807	A19
3808	E19
3811	M13
3812	M14
3813	M14
3820	M13
3824	C19
3825	C19
3826	M10
3827	M10
3828	M10
3829	M8
3830	M8
3831	M8
3832	L8
3833	K12
3834	K12
3835	K10
3836	K10
3837	K10
3838	K8
3839	K8
3840	J8
3841	J8
3842	K12
3843	K12
3844	M16
3845	M16
3846	M17
3847	M18
3848	M18
3849	M18
3850	L18
3851	L12
3852	L12
3856	G17
3858	E8
3859	E9
3860	E9
3870	C8
3871	C8
4740	D9
4741-A	B9
4741-B	B9
4741-C	B9
4741-D	B9
4750	D9
4752	C13
4753	J11
4754	C13
4765	G18
4766	G18
4767	G18
4768	G18
5723	E18
5724	C17
5725	B17
5726	B15
5727	A15
5728	B18
5729	A17
5730	A17
5732	M9
5733	K9
5734	M17
5736	A14
7720	E19
7722	D3
7723	J3
7724	F12
7725	B19
7730	M8
7731	L8
7732	K8
7733	J8
7734	M18
7735	L18
7739	D19
7740	E9
F200	E20
F202	J9
F203	L9
F204	L18
F205	K10
F206	M10
F207	M16
F208	D19
F210	B17
F211	C17
F212	A17
F213	A17
F214	A14
F215	A16
F216	B16
F219	B20
F220	H17
F225	K15

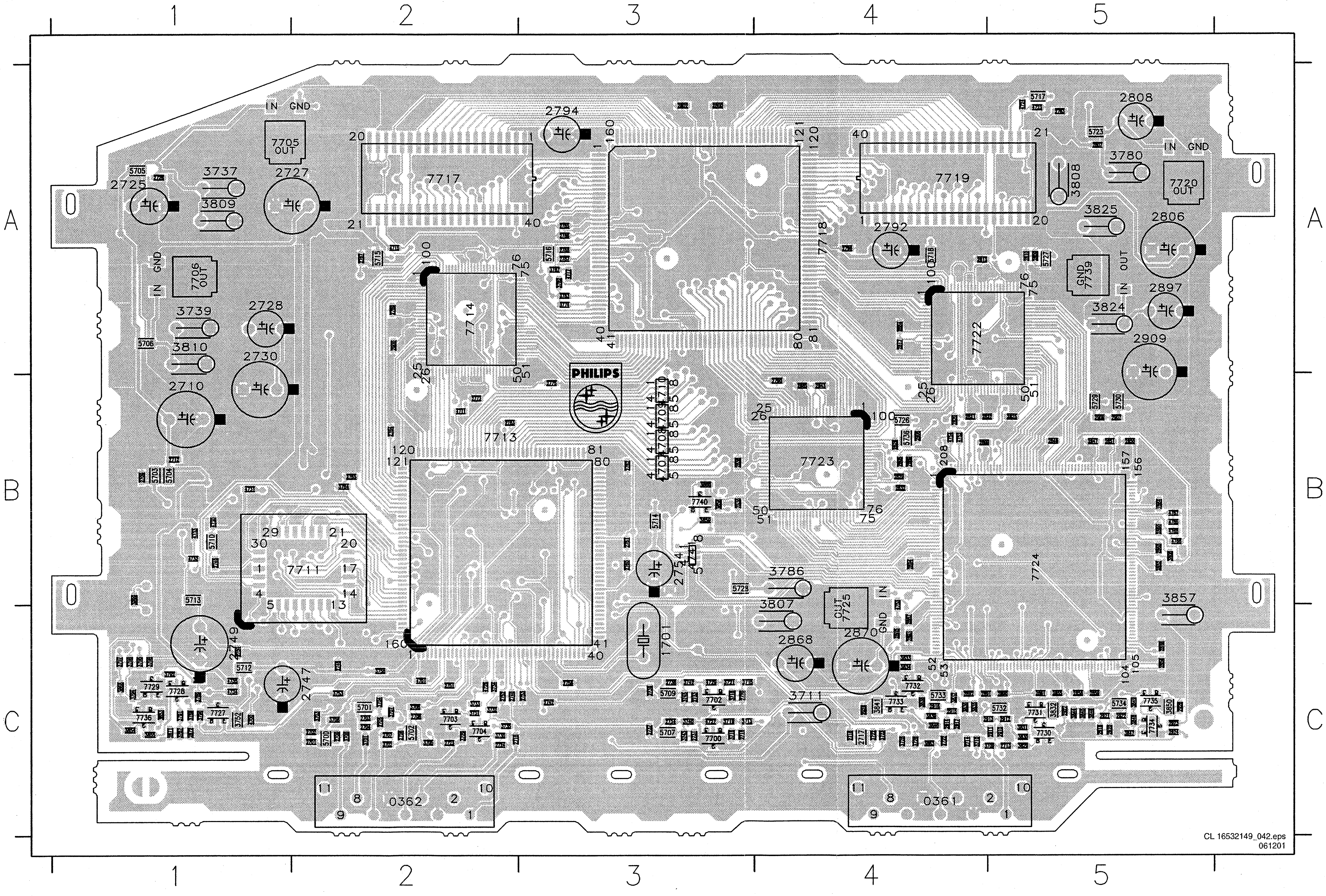
Feature Box 7 Panel: Falconic


L3
FALCONIC (FEATURE BOX 7)
L3
7718
SAA4992
FALCONIC
COMPRESS
DECOMPRESS
DEINTERLACER
PIXEL PEAK
VECTORS
MOTION ESTIMATOR
LEFT MPRAM
RIGHT MPRAM
UPCONVERSION
VERTICAL PEAKING
VERTICAL ZOOM
DNR
BST
SNERT INTER
CONTROL
7717
MSM54V12222A
FIELD MEMORY 2
7719
MSM54V12222A
FIELD MEMORY 3
L1
L2
8204 000 64316
CL 36532021_012.eps
040403

2782	G1
2783	I12
2784	D1
2785	D4
2786	E4
2787	F4
2788	E4
2789	I6
2790	I8
2791	E14
2792	E13
2793	D14
2794	D13
2795	G11
2796	E11
2797	E11
2798	C11
2799	E14
2800	B8
2801	B7
2802	B7
2803	B5
3766	E4
3767	E3
3773	G3
3774	H3
3781	G3
3782	G3
3783	H3
4712	D3
4713	D2
4714	G2
4715	G2
4716	E4
4717	E3
4720	G4
4721	F14
4722	F14
4723	I14
4724	I14
5716	C1
5717	E14
5718	D14
5719	D14
7717	D1
7718	B4
7719	F13
F221	D13
F222	D13
F223	F14
F224	D1
F226	H14
F227	G1

Layout Feature Box 7 Panel (Top View)

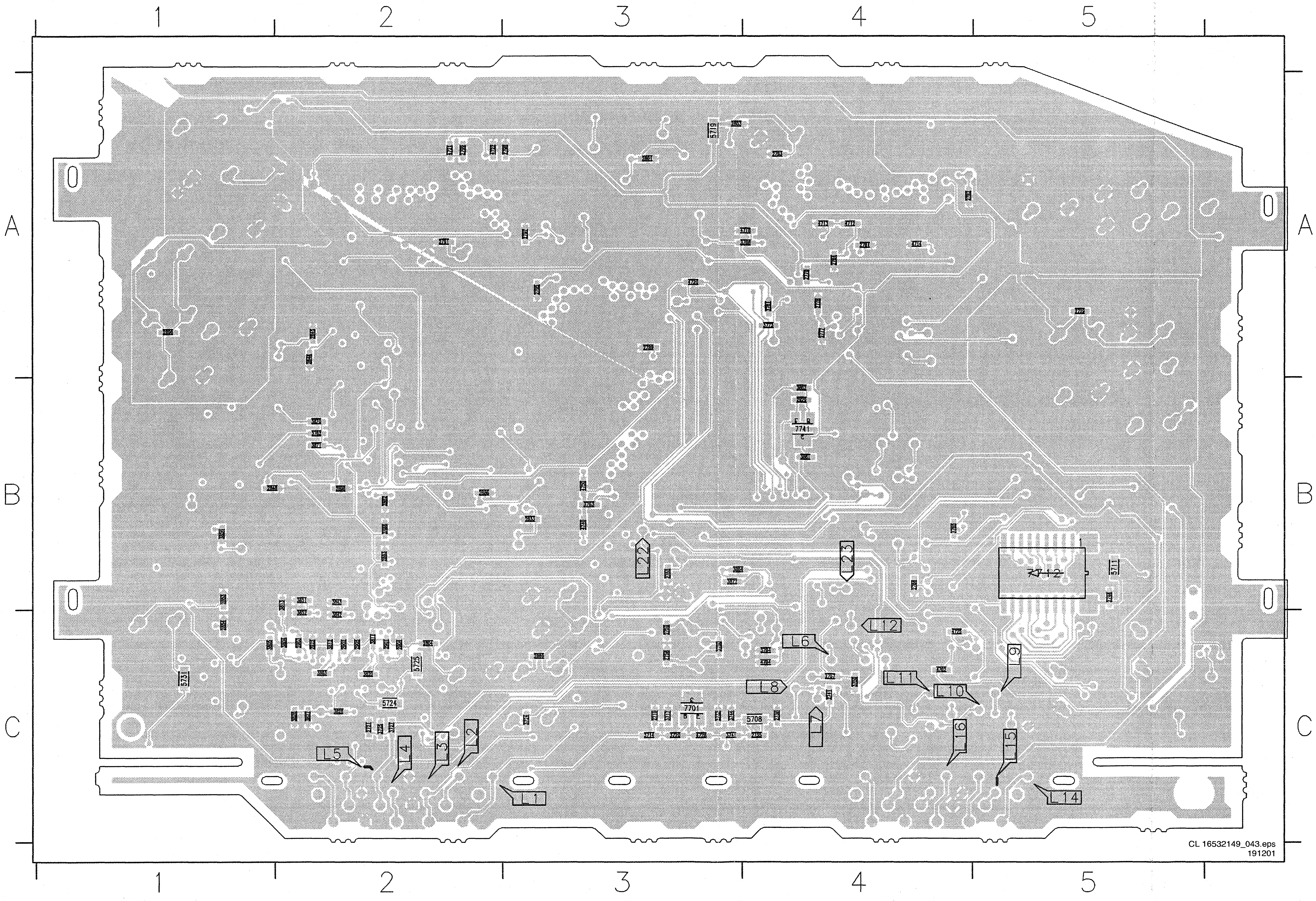
0361	C4
0362	C2
1701	C3
2700	C2
2701	C2
2702	C2
2703	C2
2704	C2
2705	C2
2706	C2
2707	C2
2708	C2
2709	B1
2710	B1
2712	B1
2713	C5
2714	C4
2715	C2
2716	C4
2717	C4
2718	C3
2720	C3
2722	C4
2723	C2
2724	C2
2725	A1
2726	A1
2727	A2
2728	A1
2730	B1
2731	C3
2733	C3
2734	C3
2736	C3
2737	C3
2739	C3
2740	C2
2742	C3
2745	B1
2747	C2
2748	C2
2749	C1
2750	C1
2751	C2
2752	C2
2753	C3
2754	B3
2756	C3
2760	B3
2761	B3
2762	B3
2763	B2
2764	B2
2765	B2
2767	A2
2769	A2
2773	B2
2775	B3
2783	A5
2785	A3
2786	A3
2787	A3
2788	A3
2790	B4
2792	A4
2794	A3
2796	A4
2800	A3
2802	A3
2805	C4
2806	A5
2807	A5
2808	A5
2809	A5
2810	A5
2813	A4
2817	A4
2820	B4
2821	B4
2822	B4
2825	B5
2826	B4
2829	B4
2832	B4
2835	B3
2838	B3
2843	B4
2847	B5
2849	B5
2850	B5
2851	B5
2852	B5
2855	C5
2856	C5
2858	C5
2859	C5
2860	B5
2861	C5
2864	B5
2865	B5
2866	C5
2867	C4
2868	C4
2870	C4
2871	C1
2872	C1
2884	A4
2885	B4
2889	B4
2890	C5
2891	C4
2892	C4
2893	C4
2894	B4
2895	B4
2897	A5
2899	B4
2900	A2
2906	B5
2907	B5
2908	B4
2909	A5
2910	C5
2911	C5
2912	C5
2913	C5
2914	C4
2915	C4
2916	C4
2917	C4
2918	C5
2920	C5
2921	C5
2922	C5
2923	C5
2924	C5
2926	C5
2927	C5
2928	C4
3700	C2
3701	C2
3702	C2
3703	C2
3704	C2
3705	C2
3706	C2
3707	C2
3708	C2
3709	C5
3710	C4
3711	C4
3713	C3
3715	C3
3716	C3
3718	C3
3719	C3
3721	C3
3722	C4
3723	C4
3726	C4
3728	C4
3729	C2
3730	C2
3731	C2
3732	C2
3733	C2
3734	C2
3735	C2
3737	A1
3739	A1
3740	C3
3742	C3
3743	C3
3745	C3
3752	C1
3753	C2
3758	C2
3764	B2
3767	A3
3774	A3
3780	A5
3782	A3
3783	A3
3786	B4
3787	C1
3788	C1
3789	C1
3790	C1
3791	C1
3792	C1
3793	C1
3794	C1
3795	C1
3796	C1
3797	C1
3798	C1
3806	B5
3807	B4
3808	A5
3809	A1
3810	A1
3824	A5
3825	A5
3829	C5
3830	C5
3831	C5
3832	C5
3833	C4
3834	C4
3835	C4
3836	C4
3837	C4
3838	C4
3839	C4
3840	C4
3841	C4
3844	C5
3845	C5
3846	C5
3847	C5
3848	C5
3849	C5
3850	C5
3853	C1
3854	C1
3855	C1
3857	B5
3858	B3
3859	B3
3860	B3
3863	C4
3865	C1
3999	B1
4700	C1
4701	C2
4707	B3
4708	B3
4709	B3
4710	B3
4711	B2
4715	A2
4717	A3
4723	A5
4724	A5
4726	C2
4727	C3
4729	C3
4730	B1
4731	B1
4732	B1
4733	B1
4734	C1
4735	C1
4741	B3
4752	B4
4753	C4
4754	B4
4765	B5
4766	B5
4767	B5
4768	B5
5700	C2
5701	C2
5702	C2
5703	B1
5704	B1
5705	A1
5706	A1
5707	C3
5709	C3
5710	B1
5712	C1
5713	B1
5714	B3
5715	A2
5716	A3
5717	A5
5718	A4
5723	A5
5726	B4
5727	A5
5728	B3
5729	B5
5730	B5
5732	C5
5733	C4
5734	C5
5736	B4
7700	C3
7702	C3
7703	C2
7704	C2
7705	A2
7706	A1
7711	B2
7713	B2
7714	A3
7717	A2
7718	A4
7719	A4
7720	A5
7722	A5
7723	B4
7724	B5
7725	C4
7727	C1
7728	C1
7729	C1
7730	C5
7731	C5
7732	C4
7733	C4
7734	C5
7735	C5
7736	C1
7739	A5
7740	B3



CL 16532149_042.eps
061201

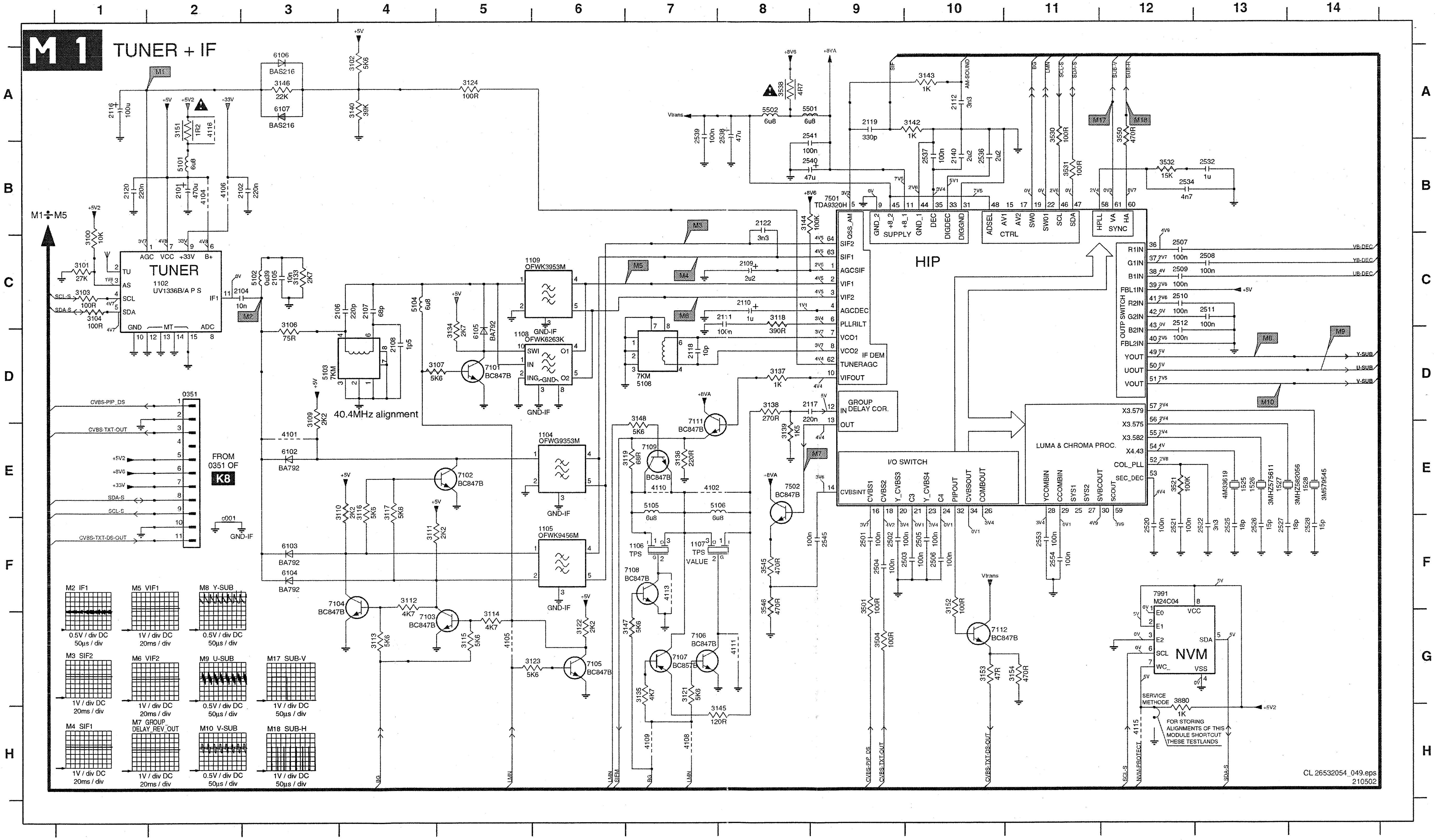
Layout Feature Box 7 Panel (Bottom View)

2719	C3
2721	C2
2729	A5
2732	C3
2735	C4
2738	C4
2741	C4
2746	B5
2755	B3
2757	C4
2758	C3
2759	C3
2766	B4
2777	A4
2778	A4
2779	A4
2781	A4
2782	A4
2784	A4
2789	A3
2791	A2
2793	A4
2795	A3
2797	A3
2798	A3
2799	A2
2801	A3
2803	A3
2804	C2
2833	B3
2845	A2
2846	A2
2848	B1
2853	B1
2854	C1
2862	B2
2863	B2
2869	C3
2886	B2
2888	B2
2896	A1
2898	B2
2901	C2
2902	C2
2903	C2
2904	C2
2905	C2
2925	C2
2929	B4
3714	C3
3717	C3
3720	C3
3724	C3
3725	C2
3727	C2
3741	C3
3744	C3
3759	C4
3760	C3
3762	B2
3763	B3
3765	B4
3766	A4
3773	A4
3781	A4
3784	C4
3803	C2
3804	C2
3805	C1
3811	C2
3812	C2
3813	B2
3820	C2
3826	C2
3827	C2
3828	C2
3842	C2
3843	B2
3851	B2
3852	C2
3856	B1
3861	B4
3862	B4
3864	B3
3870	B2
3871	B2
3872	B3
4702	C4
4704	C4
4712	A4
4713	A4
4714	A4
4716	A4
4720	A3
4721	A2
4722	A2
4725	C4
4728	C3
4740	B3
4750	B3
5708	C4
5711	B5
5719	A3
5724	C2
5725	C2
5731	C1
7701	C3
7712	C5
7741	B4


1
2
3
4
5
A
B
C
5719
7741
7712
5711
L22
L23
L12
L6
L8
L11
L10
L9
L7
L16
L15
L14
L1
L2
L3
L4
L5
5724
5725
5731
7701
5708
CL 16532149_043.eps
191201

Double Window Panel: Tuner + IF

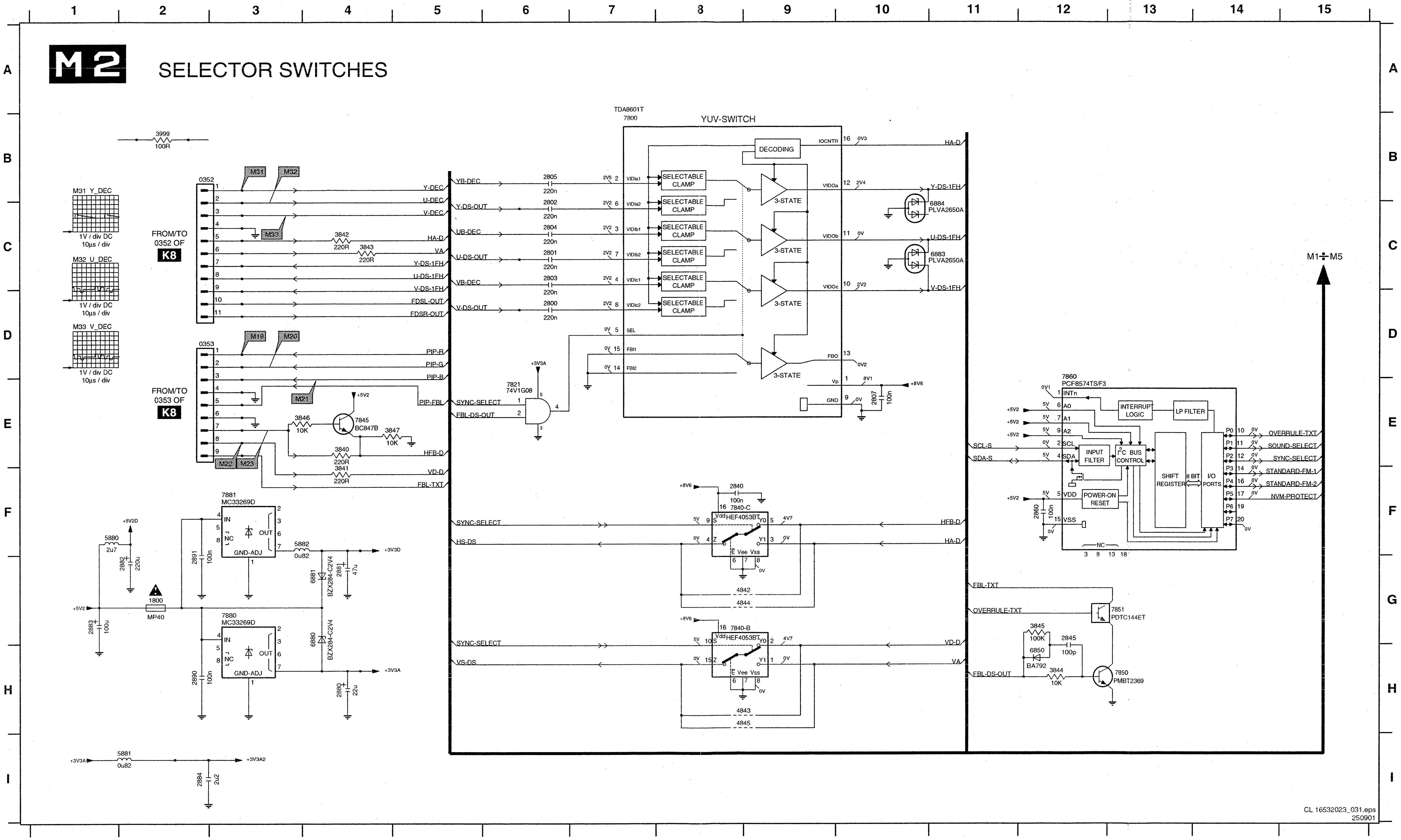
0351 D2	1109 C5	2104 C2	2111 C8	2122 B8	2506 F10	2520 F12	2532 B13	2541 A8	3103 C1	3112 F4	3119 E7	3135 G7	3143 A10	3152 F10	3531 B11	4101 E3	4110 E7	5103 D3	6102 E3	7102 E5	7109 E7
1102 C2	1525 E13	2105 C3	2112 A10	2140 B10	2507 C12	2521 F12	2534 B12	2545 F9	3104 C1	3113 G4	3121 G7	3136 E7	3144 B8	3153 G10	3532 B12	4102 E7	4111 G8	5104 C4	6103 F3	7103 G4	7111 E7
1104 E6	1526 E13	2106 C4	2116 A1	2501 F9	2508 C13	2522 F13	2536 B10	2553 F11	3106 C3	3114 G5	3122 G6	3137 D8	3145 H8	3154 G11	3538 A8	4104 B2	4113 F7	5105 E7	6104 F3	7104 F4	7112 G10
1105 F6	1527 E13	2107 C4	2117 D8	2502 F9	2509 C12	2525 F13	2537 B10	2554 F11	3107 D5	3115 G5	3123 G6	3138 D8	3146 A3	3501 F9	3545 F8	4105 G5	4115 H12	5106 E7	6105 D5	7105 G6	7501 B9
1106 F7	1528 E14	2108 D4	2118 D7	2503 F10	2510 C12	2526 F13	2538 A8	3100 C1	3109 D3	3116 E4	3124 A5	3139 E8	3147 G7	3504 G9	3546 F8	4106 B2	4116 A2	5108 D7	6106 A3	7106 G7	7502 E8
1107 F7	2101 B2	2109 C8	2119 A9	2504 F9	2511 C13	2527 F13	2539 A7	3101 C1	3110 E4	3117 E4	3133 C3	3140 A4	3148 D7	3521 E12	3550 A12	4108 H7	5101 B2	5501 A8	6107 A3	7107 G7	7991 F12
1108 D5	2102 B3	2110 C8	2120 B1	2505 F10	2512 C12	2528 F14	2540 B8	3102 A4	3111 F4	3118 C8	3134 D5	3142 A10	3151 A2	3530 A11	3880 G12	4109 H7	5102 C3	5502 A8	7101 D5	7108 F6	c001 F1



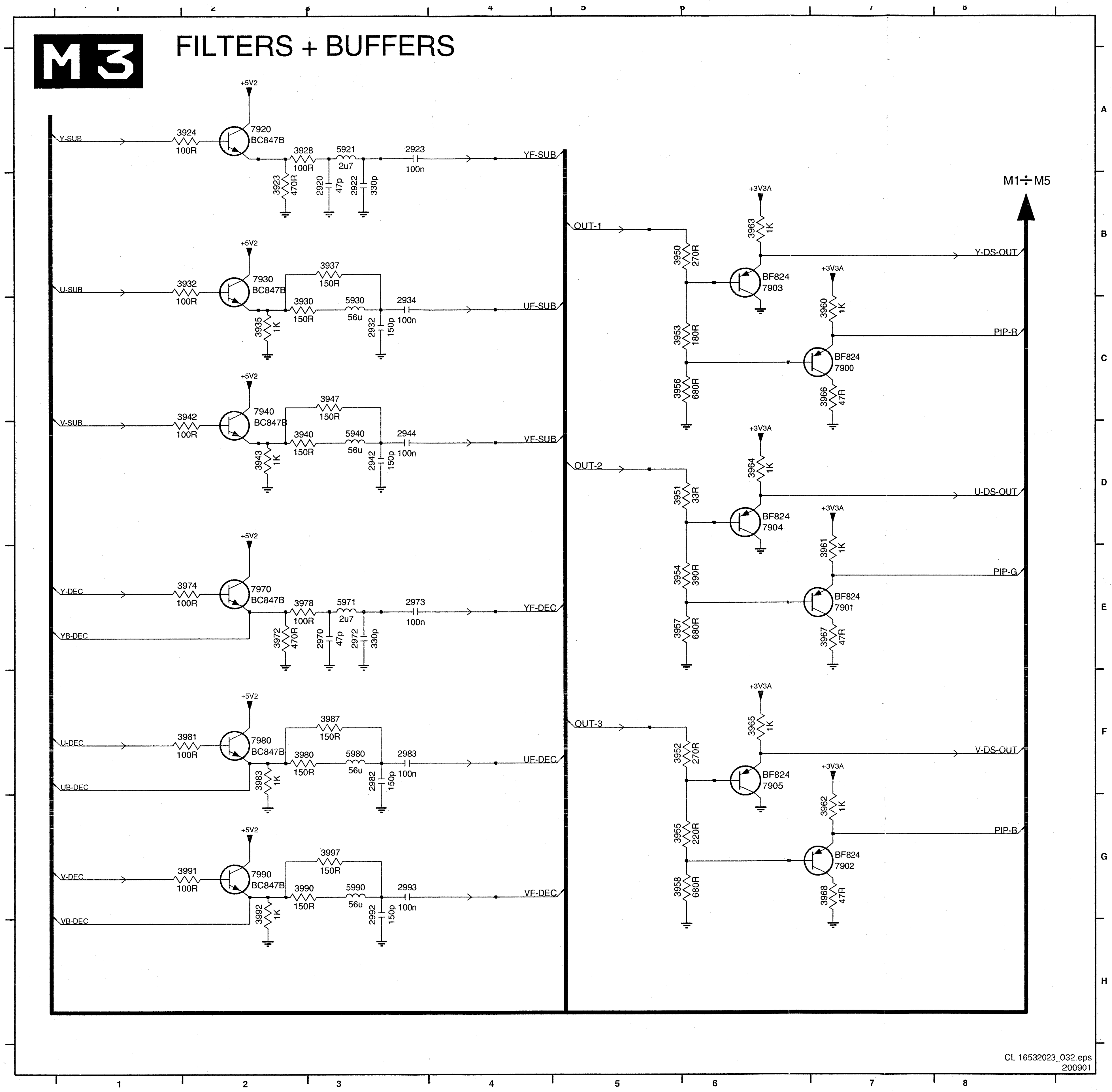
M1 TUNER + IF
M1 ÷ M5
TUNER
1102 UV1336B/A P S
AGC VCC +33V B+
TU AS SCL SDA GND MT ADC IF1
0351
FROM 0351 OF K8
CVBS-PIP_DS
CVBS-TXT-OUT
CVBS-TXT-DS-OUT
SDA-S
SCL-S
+5V2
+8V6
+33V
c001 GND-IF
40.4MHz alignment
1109 OFWK3953M
1108 OFWK6263K
1104 OFWG9353M
1105 OFWK9456M
GND-IF
5103 7KM
5108 7KM
BAS216
BA792
BC847B
BC857B
1106 TPS
1107 TPS VALUE
7501 TDA9320H
HIP
SUPPLY
CTRL
SYNC
IF DEM
GROUP DELAY COR.
I/O SWITCH
LUMA & CHROMA PROC.
OUTP SWITCH
SIF2 SIF1 AGCSIF VIF1 VIF2 AGCDEC PLLRILT VCO1 VCO2 TUNERAGC VIFOUT
R1IN G1IN B1IN FBL1IN R2IN G2IN B2IN FBL2IN YOUT UOUT VOUT
X3.579 X3.575 X3.582 X4.43 COL_PLL SEC_DEC
CVBSINT CVBS1 CVBS2 Y_CVBS3 C3 Y_CVBS4 C4 PIPOUT CVBSOUT COMBOUT
YCOMBIN CCOMBIN SYS1 SYS2 SVBCOUT SCOUT
4M433619 3MHZ575611 3MHZ582056 3M579545
7991 M24C04 NVM
E0 E1 E2 SCL WC VCC SDA VSS
SERVICE METHODE
FOR STORING ALIGNMENTS OF THIS MODULE SHORTCUT THESE TESTLANDS
Vtrans
AM-SOUND
YB-DEC
YR-DEC
UB-DEC
Y-SUB
U-SUB
V-SUB
NVM-PROTECT
M2 IF1 0.5V / div DC 50µs / div
M5 VIF1 1V / div DC 20ms / div
M8 Y-SUB 0.5V / div DC 50µs / div
M3 SIF2 1V / div DC 20ms / div
M6 VIF2 1V / div DC 20ms / div
M9 U-SUB 0.5V / div DC 50µs / div
M17 SUB-V 1V / div DC 50µs / div
M4 SIF1 1V / div DC 20ms / div
M7 GROUP DELAY REV OUT 1V / div DC 20ms / div
M10 V-SUB 0.5V / div DC 50µs / div
M18 SUB-H 1V / div DC 50µs / div
CL 26532054_049.eps
210502

Double Window Panel: Selector Switches

0352	B3
0353	D3
1800	G2
2800	D6
2801	C6
2802	C6
2803	C6
2804	C6
2805	B6
2807	E10
2840	F8
2845	G12
2860	F12
2880	H4
2881	G4
2882	G2
2883	G1
2884	I2
2890	H2
2891	G2
3840	E4
3841	F4
3842	C4
3843	C4
3844	H12
3845	G12
3846	E3
3847	E4
3999	B2
4842	G8
4843	H8
4844	G8
4845	H8
5880	F1
5881	I2
5882	F3
6850	H12
6880	G4
6881	G4
6883	C11
6884	C11
7800	B7
7821	E6
7840-B	G8
7840-C	F8
7845	E4
7850	H13
7851	G13
7860	E12
7880	G3
7881	F3


M2
SELECTOR SWITCHES
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I
M31 Y_DEC
1V / div DC
10µs / div
M32 U_DEC
M33 V_DEC
FROM/TO 0352 OF K8
FROM/TO 0353 OF K8
0352
0353
M31
M32
M33
M19
M20
M21
M22
M23
3999 100R
3842 220R
3843 220R
3846 10K
7845 BC847B
3847 10K
3840 220R
3841 220R
Y-DEC
U-DEC
V-DEC
HA-D
VA
Y-DS-1FH
U-DS-1FH
V-DS-1FH
FDSL-OUT
FDSR-OUT
PIP-R
PIP-G
PIP-B
PIP-FBL
HFB-D
VD-D
FBL-TXT
YB-DEC
Y-DS-OUT
UB-DEC
U-DS-OUT
VB-DEC
V-DS-OUT
SYNC-SELECT
FBL-DS-OUT
2805 220n
2802 220n
2804 220n
2801 220n
2803 220n
2800 220n
TDA8601T
7800
YUV-SWITCH
DECODING
SELECTABLE CLAMP
3-STATE
IOCNTR
VIDOa
VIDOb
VIDOc
FBO
SEL
FBI1
FBI2
Vp
GND
2807 100n
+8V6
6884 PLVA2650A
6883 PLVA2650A
M1÷M5
7821 74V1G08
+3V3A
7860 PCF8574TS/F3
INTn
A0
A1
A2
SCL
SDA
VDD
VSS
INTERRUPT LOGIC
LP FILTER
INPUT FILTER
I²C BUS CONTROL
POWER-ON RESET
SHIFT REGISTER
8 BIT
I/O PORTS
SCL-S
SDA-S
OVERRULE-TXT
SOUND-SELECT
SYNC-SELECT
STANDARD-FM-1
STANDARD-FM-2
NVM-PROTECT
2860 100n
7881 MC33269D
7880 MC33269D
IN
OUT
NC
GND-ADJ
5880 2u7
2882 220u
+5V2D
2891 100n
5882 0u82
6881 BZX284-C2V4
2881 47u
+3V3D
1800 MP40
+5V2
2883 100u
6880 BZX284-C2V4
2890 100n
2880 22u
+3V3A
5881 0u82
+3V3A2
2884 2u2
2840 100n
7840-C HEF4053BT
7840-B HEF4053BT
HS-DS
VS-DS
4842
4844
4843
4845
FBL-TXT
OVERRULE-TXT
FBL-DS-OUT
7851 PDTC144ET
3845 100K
6850 BA792
2845 100p
3844 10K
7850 PMBT2369
CL 16532023_031.eps
250901

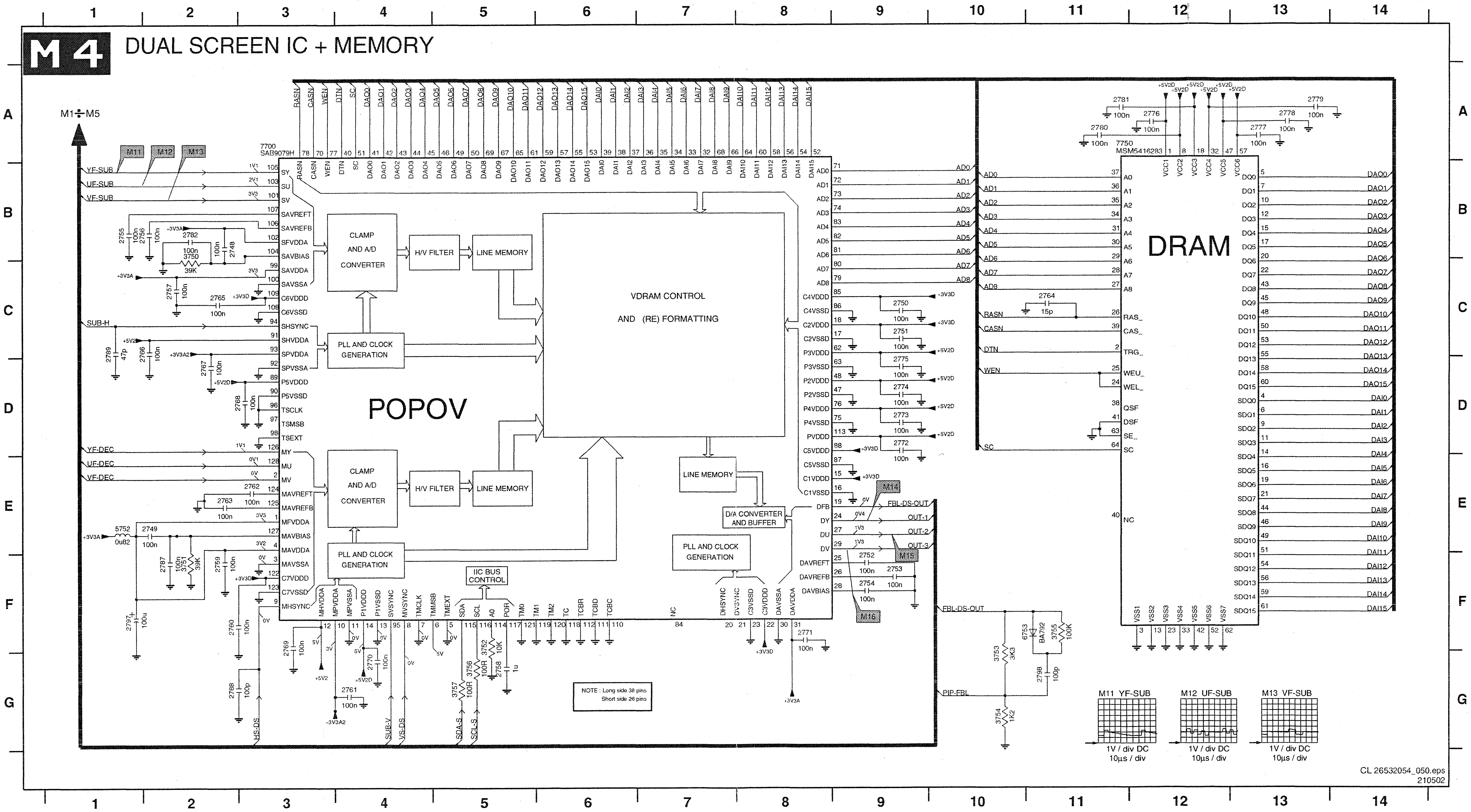
Double Window Panel: Filters + Buffers


M 3
FILTERS + BUFFERS
+5V2
Y-SUB
3924
100R
7920
BC847B
3928
100R
5921
2u7
2923
100n
YF-SUB
3923
470R
2920
47p
2922
330p
U-SUB
3932
100R
7930
BC847B
3937
150R
3930
150R
5930
56u
2934
100n
UF-SUB
3935
1K
2932
150p
V-SUB
3942
100R
7940
BC847B
3947
150R
3940
150R
5940
56u
2944
100n
VF-SUB
3943
1K
2942
150p
Y-DEC
3974
100R
7970
BC847B
3978
100R
5971
2u7
2973
100n
YF-DEC
YB-DEC
3972
470R
2970
47p
2972
330p
U-DEC
3981
100R
7980
BC847B
3987
150R
3980
150R
5980
56u
2983
100n
UF-DEC
UB-DEC
3983
1K
2982
150p
V-DEC
3991
100R
7990
BC847B
3997
150R
3990
150R
5990
56u
2993
100n
VF-DEC
VB-DEC
3992
1K
2992
150p
OUT-1
3950
270R
+3V3A
3963
1K
BF824
7903
Y-DS-OUT
3960
1K
PIP-R
3953
180R
BF824
7900
3956
680R
3966
47R
OUT-2
3951
33R
3964
1K
BF824
7904
U-DS-OUT
3961
1K
PIP-G
3954
390R
BF824
7901
3957
680R
3967
47R
OUT-3
3952
270R
3965
1K
BF824
7905
V-DS-OUT
3962
1K
PIP-B
3955
220R
BF824
7902
3958
680R
3968
47R
M1÷M5
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
CL 16532023_032.eps
200901

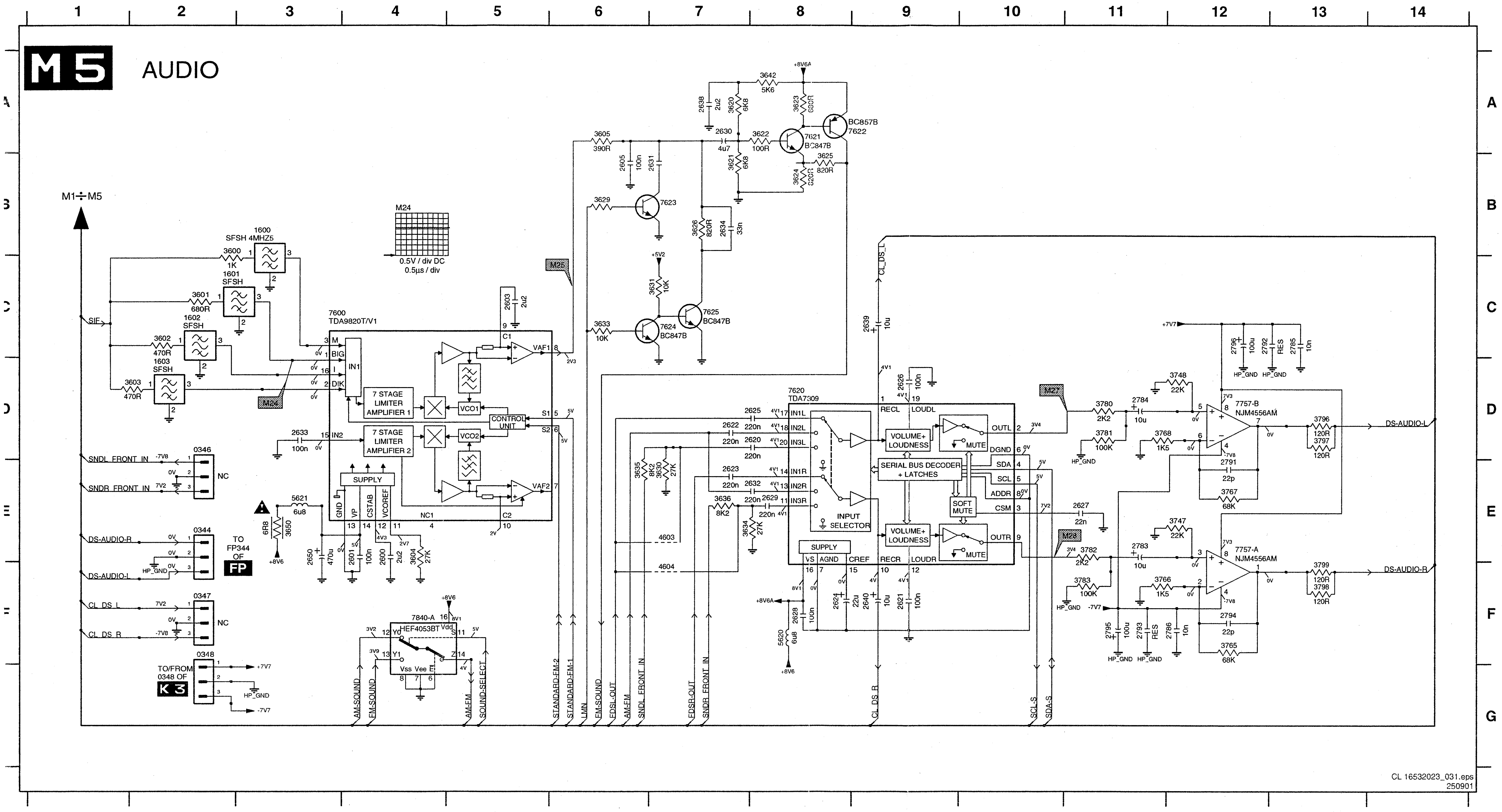
2920	B3
2922	B3
2923	A3
2932	C3
2934	C3
2942	D3
2944	D3
2970	E3
2972	E3
2973	E3
2982	F3
2983	F3
2992	G3
2993	G3
3923	B2
3924	A2
3928	A2
3930	C2
3932	B2
3935	C2
3937	B3
3940	D2
3942	C2
3943	D2
3947	C3
3950	B5
3951	D5
3952	F5
3953	C5
3954	E5
3955	G5
3956	C5
3957	E5
3958	G5
3960	C7
3961	E7
3962	G7
3963	B6
3964	D6
3965	F6
3966	C7
3967	E7
3968	G7
3972	E2
3974	E2
3978	E2
3980	F2
3981	F2
3983	F2
3987	F3
3990	G2
3991	G2
3992	G2
3997	G3
5921	A3
5930	C3
5940	D3
5971	E3
5980	F3
5990	G3
7900	C7
7901	E7
7902	G7
7903	B6
7904	D6
7905	F6
7920	A2
7930	B2
7940	C2
7970	E2
7980	F2
7990	G2

Double Window Panel: Dual Screen IC + Memory

2748	B2
2749	E2
2750	C9
2751	C9
2752	F9
2753	F9
2754	F9
2755	B1
2756	B2
2757	C2
2758	G5
2759	F2
2760	F2
2761	G4
2762	E3
2763	E2
2764	C11
2765	C2
2766	C2
2767	D2
2768	D3
2769	F3
2770	G4
2771	F8
2772	D9
2773	D9
2774	D9
2775	D9
2776	A12
2777	A13
2778	A13
2779	A13
2780	A11
2781	A11
2782	B2
2787	F2
2788	G2
2789	C1
2797	F1
2798	G11
3750	B2
3751	F2
3752	F5
3753	G10
3754	G10
3755	F11
3756	G5
3757	G5
5752	E1
6753	F11
7700	A3
7750	A11

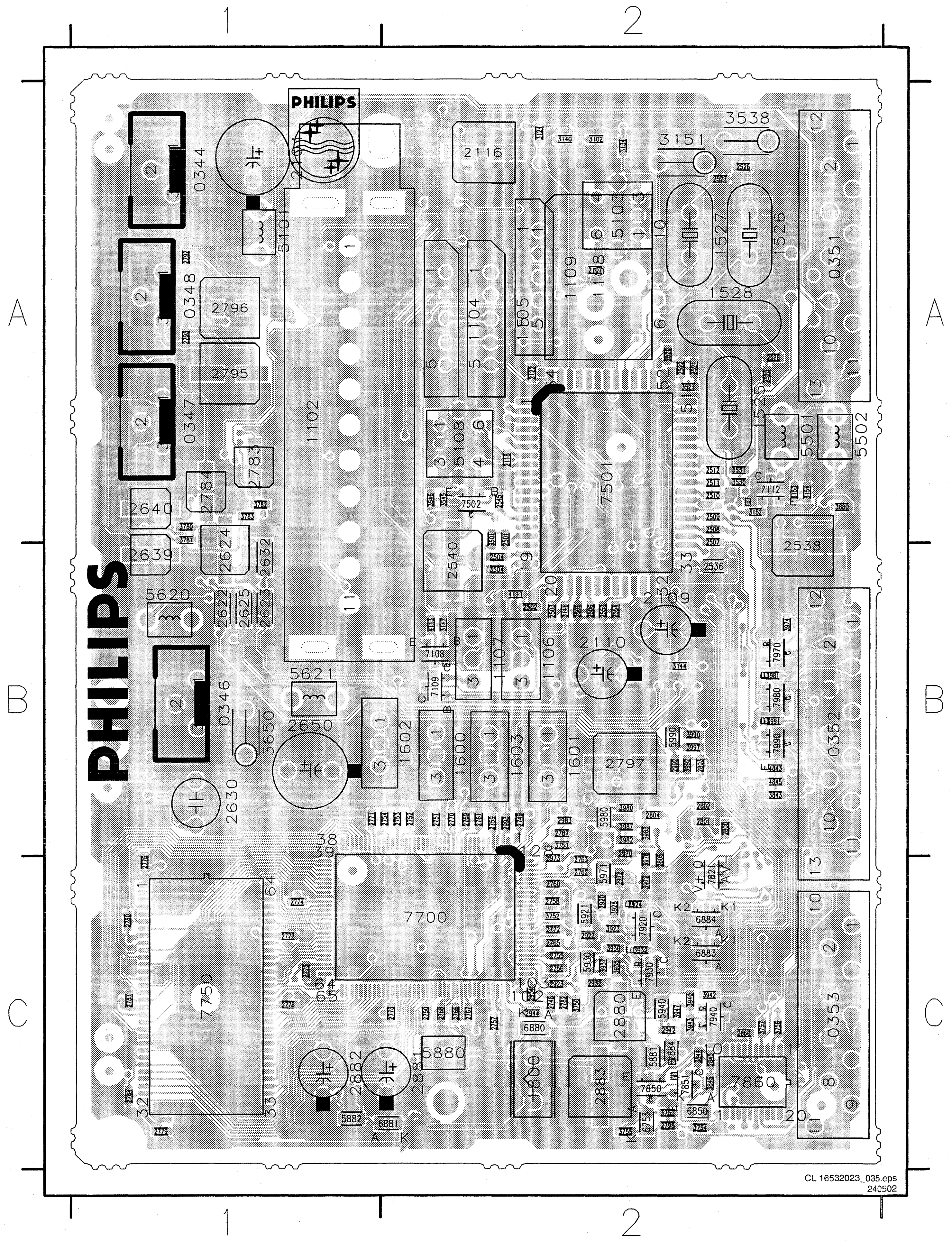

M4
DUAL SCREEN IC + MEMORY
M1÷M5
M11
M12
M13
7700
SAB9079H
POPOV
CLAMP AND A/D CONVERTER
H/V FILTER
LINE MEMORY
PLL AND CLOCK GENERATION
VDRAM CONTROL AND (RE) FORMATTING
D/A CONVERTER AND BUFFER
IIC BUS CONTROL
7750
MSM5416283
DRAM
YF-SUB
UF-SUB
VF-SUB
SUB-H
YF-DEC
UF-DEC
VF-DEC
HS-DS
SUB-V
VS-DS
SDA-S
SCL-S
FBL-DS-OUT
OUT-1
OUT-2
OUT-3
PIP-FBL
M14
M15
M16
NOTE : Long side 38 pins
Short side 26 pins
M11 YF-SUB
M12 UF-SUB
M13 VF-SUB
1V / div DC
10µs / div
CL 26532054_050.eps
210502

Double Window Panel: Audio


M5
AUDIO
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G
M1÷M5
SIF
1600 SFSH 4MHZ5
1601 SFSH
1602 SFSH
1603 SFSH
3600 1K
3601 680R
3602 470R
3603 470R
M24
0.5V / div DC
0.5µs / div
7600 TDA9820T/V1
M
BIG
I
DIK
IN1
IN2
7 STAGE LIMITER AMPLIFIER 1
7 STAGE LIMITER AMPLIFIER 2
VCO1
VCO2
CONTROL UNIT
SUPPLY
GND
VP
CSTAB
VCOREF
NC1
C1
C2
VAF1
VAF2
S1
S2
2603 2u2
2633 100n
5621 6u8
3650 6R8
2650 470u
2601 100n
2600 2u2
3604 27K
M25
3605 390R
2605 100n
2631
7623
3629
7624 BC847B
7625 BC847B
3631 10K
3633 10K
3642 5K6
2638 2u2
3620 6K8
2630 4u7
3622 100R
3621 6K8
3623 220R
7621 BC847B
7622 BC857B
3624 220R
3625 820R
3626 820R
2634 33n
+8V6A
+5V2
7620 TDA7309
RECL
LOUDL
IN1L
IN2L
IN3L
IN1R
IN2R
IN3R
INPUT SELECTOR
VOLUME+ LOUDNESS
SERIAL BUS DECODER + LATCHES
SOFT MUTE
MUTE
OUTL
DGND
SDA
SCL
ADDR
CSM
OUTR
SUPPLY
VS
AGND
CREF
RECR
LOUDR
2625 220n
2622 220n
2620 220n
2623 220n
2632 220n
2629 220n
3635 8K2
3630 27K
3636 8K2
3634 27K
2639 10u
2626 100n
2627 22n
2628 100n
5620 6u8
2624 22n
2640 10u
2621 100n
4603
4604
M27
M28
3780 2K2
2784 10u
3781 100K
3748 22K
3768 1K5
7757-B NJM4556AM
2791 22p
3767 68K
3796 120R
3797 120R
DS-AUDIO-L
3782 2K2
2783 10u
3783 100K
3747 22K
3766 1K5
7757-A NJM4556AM
2794 22p
3765 68K
3799 120R
3798 120R
DS-AUDIO-R
+7V7
-7V7
2796 100u
2792 RES
2785 10n
2795 100u
2793 RES
2786 10n
HP_GND
0346
SNDL FRONT IN
SNDR FRONT IN
NC
0344
DS-AUDIO-R
DS-AUDIO-L
TO FP344 OF
FP
0347
CL DS L
CL DS R
0348
TO/FROM 0348 OF
K3
7840-A HEF4053BT
Vdd
Vss Vee E
Y0 Y1 Z
AM-SOUND
FM-SOUND
AM-FM
SOUND-SELECT
STANDARD-FM-2
STANDARD-FM-1
LMN
FM-SOUND
FDSL-OUT
AM-FM
SNDL FRONT IN
FDSR-OUT
SNDR FRONT IN
CL DS L
CL DS R
SCL-S
SDA-S
CL 16532023_031.eps
250901

0344	E2
0346	D2
0347	F2
0348	F2
1600	B3
1601	C2
1602	C2
1603	D2
2600	E4
2601	E4
2603	C5
2605	B6
2620	D8
2621	F9
2622	D7
2623	E7
2624	F8
2625	D8
2626	D9
2627	E11
2628	F8
2629	E8
2630	A7
2631	B7
2632	E8
2633	D3
2634	B7
2638	A7
2639	C9
2640	F9
2650	E3
2783	E11
2784	D11
2785	C13
2786	F12
2791	E12
2792	C12
2793	F11
2794	F12
2795	F11
2796	C12
3600	B2
3601	C2
3602	C2
3603	D2
3604	E4
3605	A6
3620	A7
3621	B7
3622	A8
3623	A8
3624	B8
3625	B8
3626	B7
3629	B6
3630	E7
3631	C7
3633	C6
3634	E7
3635	E6
3636	E7
3642	A8
3650	E3
3747	E12
3748	D12
3765	F12
3766	F11
3767	E12
3768	D11
3780	D11
3781	D11
3782	E11
3783	F11
3796	D13
3797	D13
3798	F13
3799	F13
4603	E7
4604	F7
5620	F8
5621	E3
7600	C3
7620	D8
7621	A8
7622	A8
7623	B7
7624	C7
7625	C7
7757-A	E12
7757-B	D12
7840-A	F4

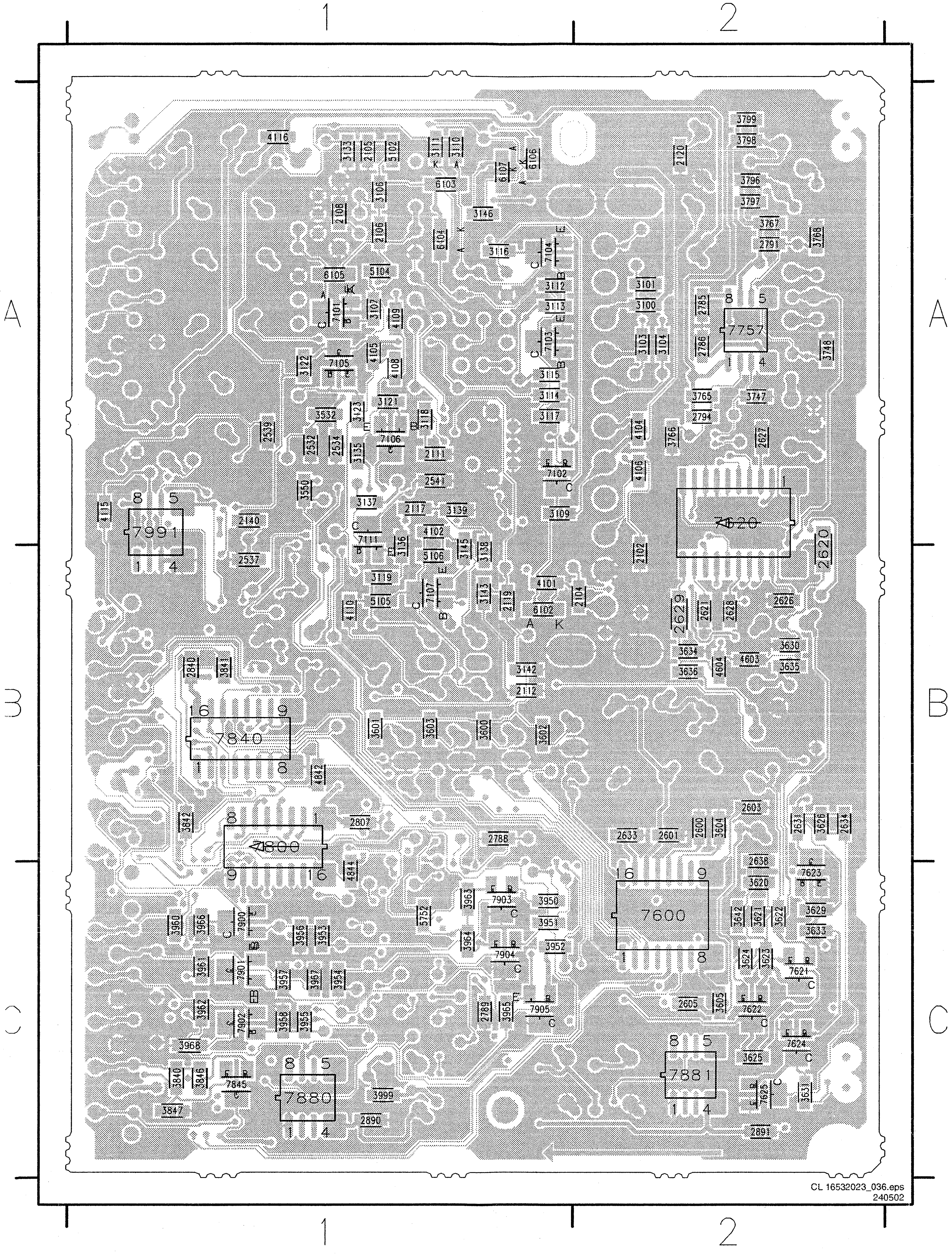
Layout Double Window Panel (Top Side)


1
2
A
B
C
PHILIPS
0344
0348
0347
0346
0351
0352
0353
1102
1104
1105
1109
1108
5103
1527
1526
1528
1525
5501
5502
3538
3151
2116
2796
2795
2784
2783
2640
2639
2624
2632
2622
2625
2623
5620
5621
2650
3650
2630
5108
7502
7501
2540
2538
2536
7112
1107
1106
2110
2109
7108
7109
1602
1600
1603
1601
2797
5990
5980
7700
7750
7970
7980
7990
6884
6883
6880
2880
5880
2882
2881
5882
6881
2883
7850
7851
6850
6753
7860
7920
7930
7940
5971
5921
5930
5940
7821

CL 16532023_035.eps
240502

0344	A1	2802	B2	7109	B2
0346	B1	2803	B2	7112	A2
0347	A1	2804	B2	7501	B2
0348	A1	2805	C2	7502	A2
0351	A2	2845	C2	7700	C1
0352	B2	2860	C2	7750	C1
0353	C2	2880	C2	7821	C2
1102	A1	2881	C1	7850	C2
1104	A2	2882	C1	7851	C2
1105	A2	2883	C2	7860	C2
1106	B2	2884	C2	7920	C2
1107	B2	2920	C2	7930	C2
1108	A2	2922	C2	7940	C2
1109	A2	2923	C2	7970	B2
1525	A2	2932	C2	7980	B2
1526	A2	2934	C2	7990	B2
1527	A2	2942	C2		
1528	A2	2944	C2		
1600	B2	2970	B2		
1601	B2	2972	C2		
1602	B2	2973	C2		
1603	B2	2982	B2		
1800	C2	2983	B2		
2101	A1	2992	B2		
2107	A2	2993	B2		
2109	B2	3102	A2		
2110	B2	3124	A2		
2116	A2	3134	A2		
2118	A2	3140	A2		
2122	A2	3144	B2		
2501	A2	3147	B2		
2502	B2	3148	B2		
2503	B2	3151	A2		
2504	B2	3152	A2		
2505	B2	3153	A2		
2506	B2	3154	A2		
2507	A2	3501	A2		
2508	A2	3504	B2		
2509	A2	3521	A2		
2510	A2	3530	A2		
2511	A2	3531	A2		
2512	A2	3538	A2		
2520	A2	3545	A2		
2521	A2	3546	A2		
2522	A2	3650	B1		
2525	A2	3750	C2		
2526	A2	3751	B2		
2527	A2	3752	C2		
2528	A2	3753	C2		
2536	B2	3754	C2		
2538	B2	3755	C2		
2540	B2	3756	C2		
2545	A2	3757	C2		
2553	B2	3780	A1		
2554	B2	3781	A1		
2622	B1	3782	A1		
2623	B1	3783	A1		
2624	B1	3843	B2		
2625	B1	3844	C2		
2630	B1	3845	C2		
2632	B1	3880	A2		
2639	A1	3923	C2		
2640	A1	3924	C2		
2650	B1	3928	C2		
2748	C2	3930	C2		
2749	B2	3932	C2		
2750	C2	3935	C2		
2751	B2	3937	C2		
2752	B2	3940	C2		
2753	B2	3942	C2		
2754	B2	3943	C2		
2755	C2	3947	C2		
2756	C2	3972	C2		
2757	C2	3974	B2		
2758	C2	3978	C2		
2759	B2	3980	B2		
2760	C2	3981	B2		
2761	B2	3983	B2		
2762	C2	3987	B2		
2763	C2	3990	B2		
2764	C1	3991	B2		
2765	C2	3992	B2		
2766	C2	3997	B2		
2767	C2	4111	B2		
2768	C2	4113	B2		
2769	B2	4843	B2		
2770	B2	4845	B2		
2771	B1	5101	A1		
2772	C2	5103	A2		
2773	C2	5108	A2		
2774	C1	5501	A2		
2775	C1	5502	A2		
2776	C1	5620	B1		
2777	C1	5621	B1		
2778	C1	5880	C2		
2779	C1	5881	C2		
2780	C1	5882	C1		
2781	C1	5921	C2		
2782	C2	5930	C2		
2783	A1	5940	C2		
2784	A1	5971	C2		
2787	B2	5980	B2		
2792	A1	5990	B2		
2793	A1	6753	C2		
2795	A1	6850	C2		
2796	A1	6880	C2		
2797	B2	6881	C2		
2798	C2	6883	C2		
2800	B2	6884	C2		
2801	B2	7108	B2		

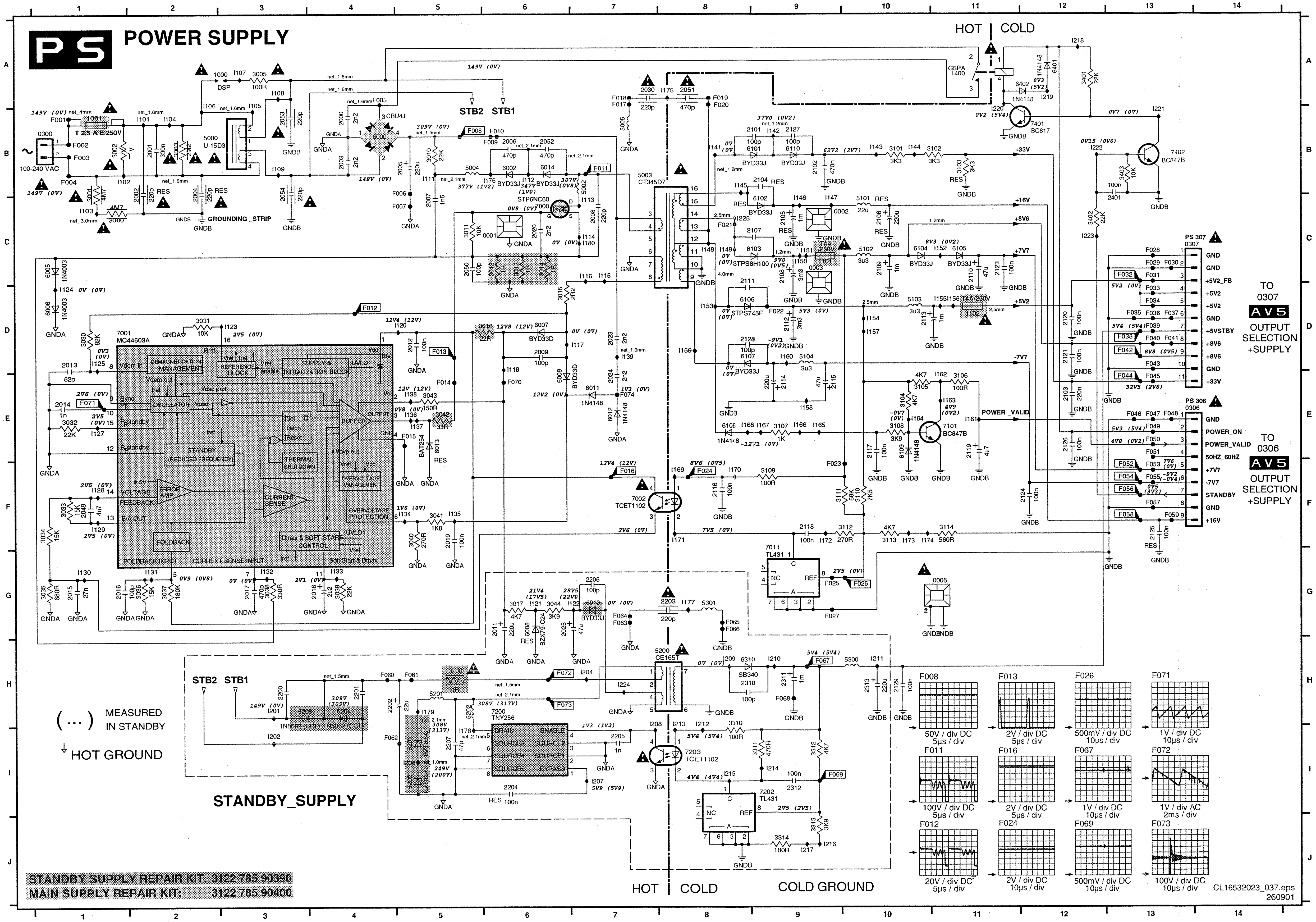
Layout Double Window Panel (Bottom Side)



CL 16532023_036.eps
240502

0344	A2	3620	C2
0346	B2	3621	C2
0347	A2	3622	C2
0348	A2	3623	C2
0351	A1	3624	C2
0352	B1	3625	C2
0353	C1	3626	B2
1102	A2	3629	C2
1104	A1	3630	B2
1105	A1	3631	C2
1106	B1	3633	C2
1107	B1	3634	B2
1108	A1	3635	B2
1109	A1	3636	B2
1525	A1	3642	C2
1526	A1	3650	B2
1527	A1	3747	A2
1528	A1	3748	A2
1600	B1	3765	A2
1601	B1	3766	A2
1602	B2	3767	A2
1603	B1	3768	A2
1800	C1	3796	A2
2101	A2	3797	A2
2102	B2	3798	A2
2104	B2	3799	A2
2105	A1	3840	C1
2106	A1	3841	B1
2108	A1	3842	B1
2109	B1	3846	C1
2110	B1	3847	C1
2111	A1	3950	C1
2112	B1	3951	C1
2117	A1	3952	C1
2119	B1	3953	C1
2120	A2	3954	C1
2140	A1	3955	C1
2532	A1	3956	C1
2534	A1	3957	C1
2537	B1	3958	C1
2539	A1	3960	C1
2541	A1	3961	C1
2600	B2	3962	C1
2601	B2	3963	C1
2603	B2	3964	C1
2605	C2	3965	C1
2620	B2	3966	C1
2621	B2	3967	C1
2626	B2	3968	C1
2627	A2	3999	C1
2628	B2	4101	B1
2629	B2	4102	A1
2630	B2	4104	A2
2631	B2	4105	A1
2633	B2	4106	A2
2634	B2	4108	A1
2638	B2	4109	A1
2650	B2	4110	B1
2785	A2	4115	A1
2786	A2	4116	A1
2788	B1	4603	B2
2789	C1	4604	B2
2791	A2	4842	B1
2794	A2	4844	C1
2807	B1	5101	A2
2840	B1	5102	A1
2881	C1	5103	A1
2882	C2	5104	A1
2890	C1	5105	B1
2891	C2	5106	B1
3100	A2	5108	A1
3101	A2	5501	A1
3103	A2	5502	A1
3104	A2	5620	B2
3106	A1	5621	B2
3107	A1	5752	C1
3109	A1	6102	B1
3110	A1	6103	A1
3111	A1	6104	A1
3112	A1	6105	A1
3113	A1	6106	A1
3114	A1	6107	A1
3115	A1	7101	A1
3116	A1	7102	A1
3117	A1	7103	A2
3118	A1	7104	A2
3119	B1	7105	A1
3121	A1	7106	A1
3122	A1	7107	B1
3123	A1	7111	A1
3133	A1	7600	C2
3135	A1	7620	A2
3136	B1	7621	C2
3137	A1	7622	C2
3138	B1	7623	C2
3139	A1	7624	C2
3142	B1	7625	C2
3143	B1	7757	A2
3145	B1	7800	B1
3146	A1	7840	B1
3151	A1	7845	C1
3532	A1	7880	C1
3538	A1	7881	C2
3550	A1	7900	C1
3600	B1	7901	C1
3601	B1	7902	C1
3602	B1	7903	C1
3603	B1	7904	C1
3604	B2	7905	C1
3605	C2	7991	A1

Power Supply


PS POWER SUPPLY
HOT | COLD
100-240 VAC
T 2,5 A E 250V
1000 DSP
3005 100R
5000 U-15D3
GROUNDING_STRIP
6000 GBU4J
STB2 STB1
149V (0V)
309V (0V)
5003 CT345D7
2030 220p
2051 470p
7000 STP6NC60
7001 MC44603A
DEMAGNETICATION MANAGEMENT
REFERENCE BLOCK
SUPPLY & INITIALIZATION BLOCK
UVLO1
OSCILLATOR
BUFFER
STANDBY (REDUCED FREQUENCY)
THERMAL SHUTDOWN
OVERVOLTAGE MANAGEMENT
OVERVOLTAGE PROTECTION
ERROR AMP
CURRENT SENSE
FOLDBACK
Dmax & SOFT-START CONTROL
FOLDBACK INPUT
CURRENT SENSE INPUT
Soft Start & Dmax
7002 TCET1102
7011 TL431
7101 BC847B
7401 BC817
7402 BC847B
1400 G5PA
+33V
+16V
+8V6
+7V7
+5V2
-7V7
POWER_VALID
PS 307 0307
GND
+5V2_FB
+5V2
+5VSTBY
+8V6
+33V
TO 0307
AV5
OUTPUT SELECTION +SUPPLY
PS 306 0306
POWER_ON
POWER_VALID
50HZ_60HZ
+7V7
-7V7
STANDBY
+16V
TO 0306
AV5
OUTPUT SELECTION +SUPPLY
STANDBY_SUPPLY
7200 TNY256
DRAIN ENABLE
SOURCE3 SOURCE2
SOURCE4 SOURCE1
SOURCE5 BYPASS
5200 CE165T
6310 SB340
7203 TCET1102
7202 TL431
HOT COLD COLD GROUND
F008 50V / div DC 5µs / div
F013 2V / div DC 5µs / div
F026 500mV / div DC 10µs / div
F071 1V / div DC 10µs / div
F011 100V / div DC 5µs / div
F016 2V / div DC 5µs / div
F067 1V / div DC 10µs / div
F072 1V / div AC 2ms / div
F012 20V / div DC 5µs / div
F024 2V / div DC 10µs / div
F069 500mV / div DC 10µs / div
F073 100V / div DC 10µs / div
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I J

(...) MEASURED IN STANDBY

HOT GROUND

STANDBY SUPPLY REPAIR KIT: 3122 785 90390

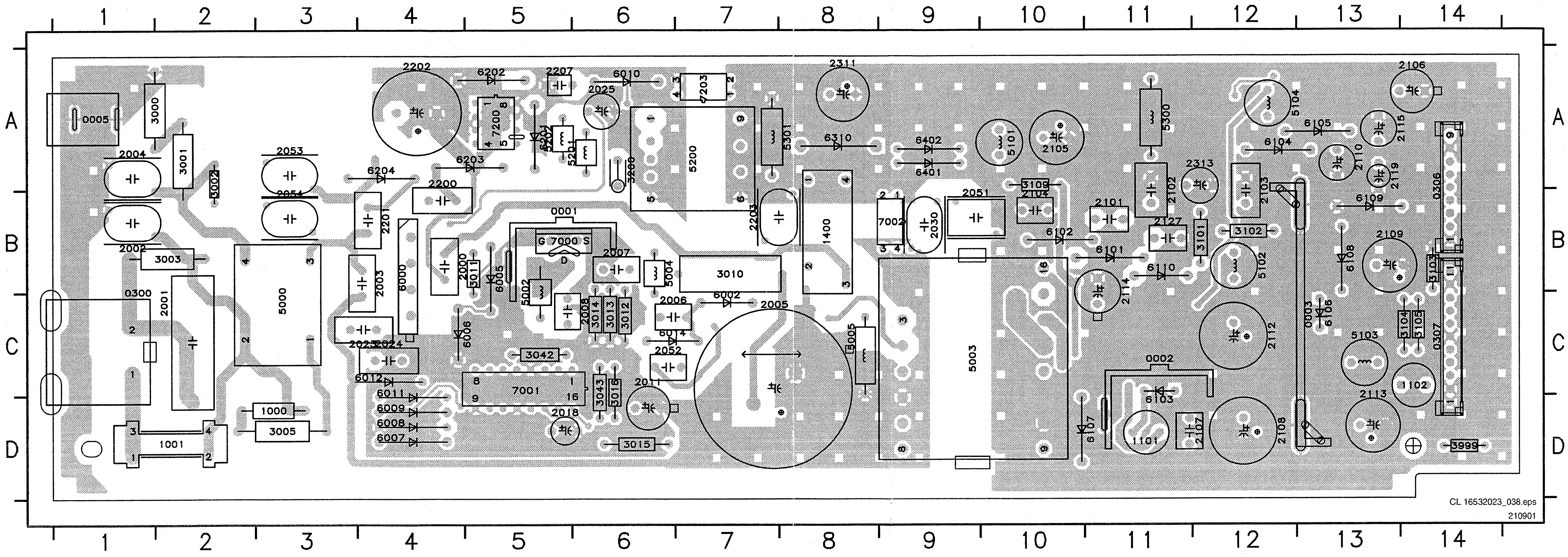
MAIN SUPPLY REPAIR KIT: 3122 785 90400

CL16532023_037.eps
260901

0001	C6
0002	C9
0003	C9
0005	I12
0300	B1
0306	E13
0307	C13
1000	A3
1001	B1
1101	C9
1102	D11
1400	A11
2000	B4
2001	B2
2002	B2
2003	B4
2004	B2
2005	B5
2006	B6
2007	C5
2008	C7
2009	D6
2011	G6
2012	D5
2013	D1
2014	E1
2015	G1
2016	G1
2017	G3
2018	G4
2019	F5
2020	C6
2023	D7
2024	E7
2025	G6
2030	A7
2049	F1
2050	C5
2051	A8
2052	B6
2053	B3
2054	B3
2101	B9
2102	B9
2103	E12
2104	B9
2105	C9
2106	C10
2107	C9
2108	C9
2109	C10
2110	C11
2111	C8
2112	D9
2113	D10
2114	E9
2115	E9
2116	F8
2117	E10
2118	F9
2119	E11
2120	D12
2121	D12
2123	C11
2124	F12
2125	F13
2126	E12
2127	B9
2128	D8
2129	H10
2200	H3
2201	H4
2202	H4
2203	G8
2204	I6
2205	I7
2206	G7
2207	I5
2310	H8
2311	H9
2312	I9
2313	H10
2401	C13
3000	C1
3001	B1
3002	B1
3003	B2
3005	A3
3010	B5
3011	C5
3012	C6
3013	C6
3014	C6
3015	D6
3016	D6
3017	G6
3030	D1
3031	D2
3032	E1
3033	F1
3034	F1
3035	G1
3036	G2
3037	G2
3038	G3
3039	G4
3040	F5
3041	F5
3042	E5
3043	E5
3044	G6
3101	B10
3102	B11
3103	B11
3104	E10
3105	E10
3106	E11
3107	E9
3108	E10
3109	F9
3110	F10
3111	F9
3112	F10
3113	F10
3114	F11
3200	H5
3310	H8
3311	I9
3312	I9
3313	J9
3314	J9
3401	A12
3402	C12
3403	B13
3999	I11
5000	B2
5002	B7
5003	B7
5004	B5
5005	B7
5101	C10
5102	C10
5103	D10
5104	D9
5200	H7
5201	H5
5202	H5
5300	H10
5301	G8
6000	B4
6002	B6
6005	C1
6006	D1
6007	D6
6008	G6
6009	E6
6010	G7
6011	E7
6012	E7
6013	E5
6014	B6
6101	B9
6102	C9
6103	C9
6104	C10
6105	C11
6106	D8
6107	D8
6108	E8
6109	E10
6110	B9
6201	I5
6202	I5
6203	H3
6204	H4
6310	H8
6401	A12
6402	A12
7000	C6
7001	D1
7002	F7
7011	G9
7101	E11
7200	H6
7202	I9
7203	I8
7401	B12
7402	B13
F001	B1
F002	B1
F003	B1
F004	B1
F005	A4
F006	B5
F007	C5
F008	B5
F009	B6
F010	B6
F011	B7
F012	D4
F013	D5
F014	E5
F015	E5
F016	F7
F017	A7
F018	A7
F019	A8
F020	B8
F021	C8
F022	D9
F023	F9
F024	F8
F025	G9
F026	G10
F027	G9
F028	C13
F029	C13
F030	C13
F031	C13
F032	C13
F033	D13
F034	D13
F035	D13
F036	D13
F037	D13
F038	D13
F039	D13
F040	D13
F041	D13
F042	D13
F043	D13
F044	E13
F045	E13
F046	E13
F047	E13
F048	E13
F049	E13
F050	E13
F051	E13
F052	F13
F053	F13
F054	F13
F055	F13
F056	F13
F057	F13
F058	F13
F059	F13
F060	H4
F061	H5
F062	I4
F063	G7
F064	G7
F065	G8
F066	G8
F067	H9
F068	H9
F069	I9
F070	E6
F071	E1
F072	H6
F073	H6
F074	E7
F996	I11
F997	I11
F998	I11
F999	I11
I101	B2
I102	B1
I103	C1
I104	B2
I105	A3
I106	A2
I107	A3
I108	A3
I109	B3
I111	B5
I112	B6
I113	C7
I114	C7
I115	C7
I116	C7
I117	D7
I118	D6
I120	D5
I121	G6
I122	G7
I123	D3
I124	D1
I125	D1
I127	E1
I128	F1
I129	F1
I130	G1
I131	G2
I132	G3
I133	G4
I134	F5
I135	F5
I136	E5
I137	E5
I138	E5
I139	D7
I141	B8
I142	B9
I143	B10
I144	B10
I145	B8
I146	C9
I147	C9
I148	C8
I149	C8
I150	C9
I151	C9
I152	C11
I153	D8
I154	D10
I155	D11
I156	D11
I157	D10
I158	E9
I159	D8
I160	D9
I161	E11
I162	E11
I163	E11
I164	E10
I165	E9
I166	E9
I167	E9
I168	E8
I169	F8
I170	F8
I171	F8
I172	F9
I173	F10
I174	F10
I175	A8
I176	B6
I177	G8
I178	I5
I179	H5
I180	C7
I201	H3
I202	I3
I204	H7
I206	I5
I207	I7
I208	H7
I209	H8
I210	H9
I211	H10
I212	H8
I213	H8
I214	I9
I215	I8
I216	J9
I217	J9
I218	A12
I219	A12
I220	A11
I221	B13
I222	B12
I223	C12
I224	H7
I225	C8

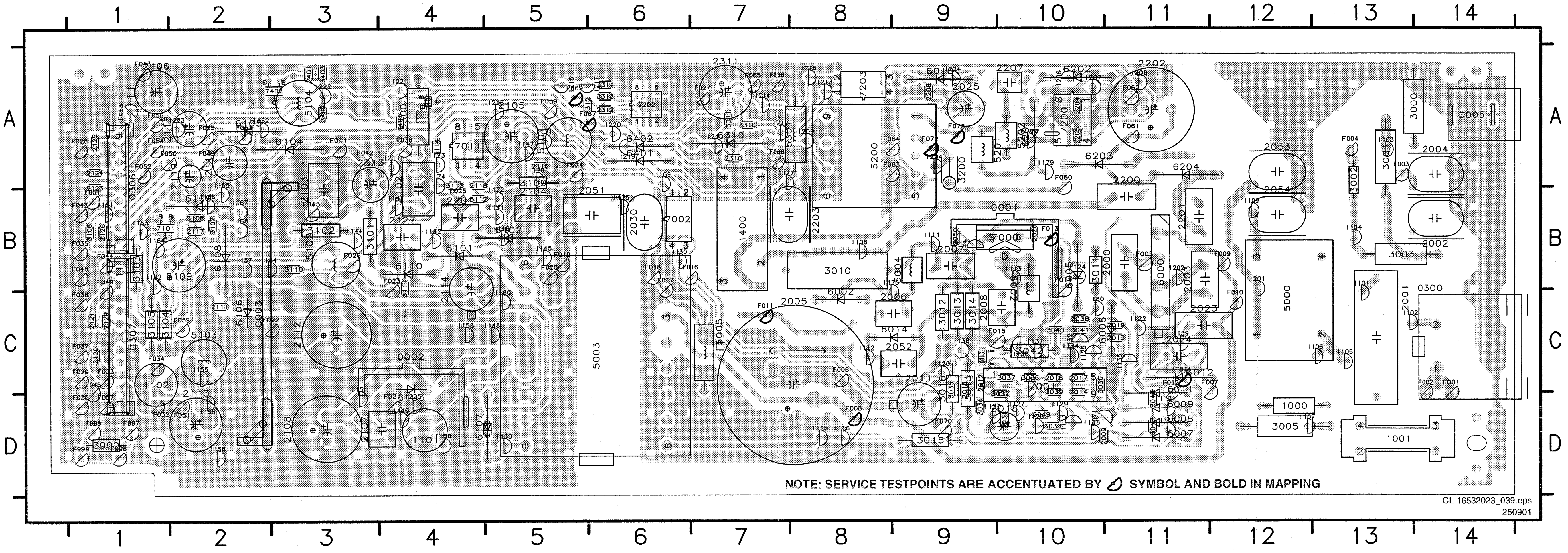
Layout Power Supply (Top Side)

0001	B5
0002	C11
0005	C13
0005	A1
0300	B1
0306	A14
0307	C14
2105	A10
2106	A14
2107	D12
2108	D12
2109	B13
2110	A13
2112	C12
3103	B14
3104	C14
3105	C14
3109	A10
3200	A6
3999	D14
5000	C3
6105	A13
6106	C13
6107	D11
6108	B13
6109	B13
6110	B11
6201	A5
1000	D3
1001	D2
1101	D11
1102	C14
1400	B8
2000	B4
2001	C2
2113	C13
2114	B11
2115	A14
2119	A13
2127	B11
2200	A4
2201	B4
5002	B5
5003	C9
5004	B6
5005	C8
5101	A10
5102	B12
5103	C13
6202	A5
6203	A5
6204	A4
6310	A8
6401	A9
6402	A9
7000	B5
2002	B1
2003	B4
2004	A1
2005	C7
2006	C6
2007	B6
2008	C6
2202	A4
2203	B7
2207	A5
2311	A8
2313	A12
3000	A1
3001	A2
5104	A12
5200	A7
5201	A5
5202	A5
5300	All
5301	A8
6000	B4
7001	C5
7002	B9
7200	A5
7203	A7
2011	C6
2018	D5
2023	C4
2024	C4
2025	A6
2030	B9
2051	B9
3002	A2
3003	B2
3005	D3
3010	B7
3011	B5
3012	C6
3013	C6
6002	C7
6005	B5
6006	C5
6007	D4
6008	D4
6009	D4
6010	A6
2052	C6
2053	A3
2054	B3
2101	B11
2102	B11
2103	B12
2104	B10
3014	C6
3015	D6
3016	C6
3042	C5
3043	C6
3101	B12
3102	B12
6011	C4
6012	C4
6014	C6
6101	B11
6102	B10
6103	D11
6104	A12



Layout Power Supply (Bottom Side)

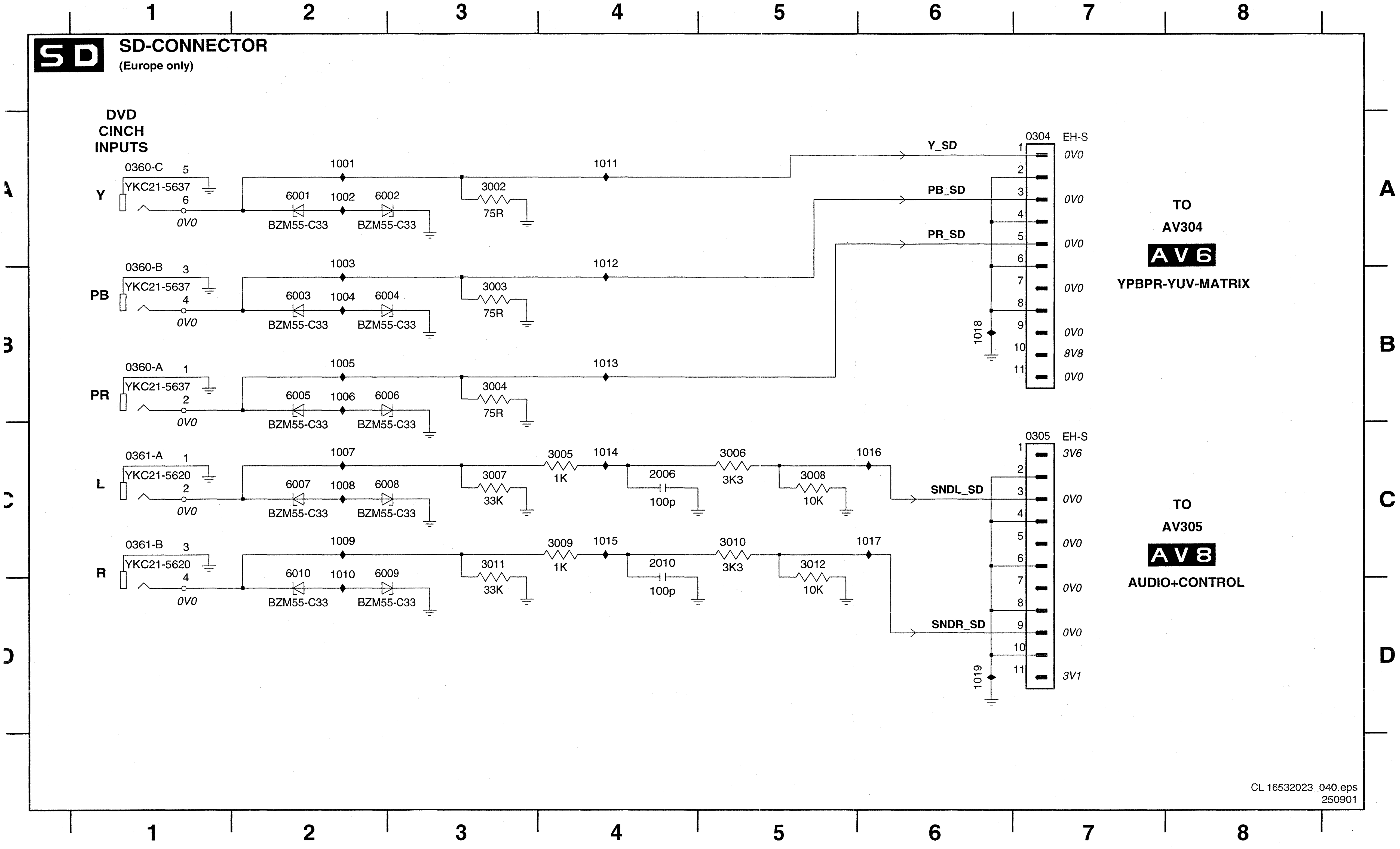
0001	B10
0002	C4
0003	C2
0005	A14
0300	B14
0306	A1
0307	C1
1000	D12
1001	D13
1101	D4
1102	C1
1400	B7
2000	B11
2001	C13
2002	B14
2003	B11
2004	A14
2005	C8
2006	C9
2007	B9
2008	C9
2009	D10
2011	C9
2012	C9
2013	C11
2014	C10
2015	C9
2016	C10
2017	C10
2018	D10
2019	C11
2020	B10
2023	C11
2024	C11
2025	A9
2030	B6
2049	D10
2050	B9
2051	B6
2052	C9
2053	A12
2054	B12
2101	B4
2102	B4
2103	B3
2104	B5
2105	A5
2106	A1
2107	D3
2108	D3
2109	B2
2110	A2
2111	C2
2112	C3
2113	C2
2114	B4
2115	A1
2116	A5
2117	B2
2118	A4
2119	A2
2120	C1
2121	C1
2123	A1
2124	A1
2125	A1
2126	B1
2127	B4
2128	D5
2129	C1
2200	A11
2201	B11
2202	A11
2203	B8
2204	A10
2205	A10
2206	A9
2207	A10
2310	A7
2311	A7
2312	A6
2313	A3
2401	A3
3000	A13
3001	A13
3002	A13
3003	B13
3005	D12
3010	B8
3011	B10
3012	C9
3013	C9
3014	C9
3015	D9
3016	C9
3017	D11
3030	C10
3031	D10
3032	D10
3033	D10
3034	D9
3035	C9
3036	C10
3037	C10
3038	C10
3039	C10
3040	C10
3041	C10
3042	C10
3043	C9
3044	D11
3101	B3
3102	B3
3103	B1
3104	C1
3105	C1
3106	B1
3107	B2
3108	B2
3109	A5
3110	B3
3111	B4
3112	B4
3113	A4
3114	A4
3200	A9
3310	A7
3311	A7
3312	A6
3313	A6
3314	A6
3401	A4
3402	A3
3403	A3
3999	D1
5000	C12
5002	B10
5003	C6
5004	B9
5005	C7
5101	A5
5102	B3
5103	C2
5104	A3
5200	A8
5201	A10
5202	A10
5300	A4
5301	A7
6000	B11
6002	C8
6005	B10
6006	C10
6007	D11
6008	D11
6009	D11
6010	A9
6011	C11
6012	C11
6013	C9
6014	C9
6101	B4
6102	B5
6103	D4
6104	A3
6105	A2
6106	C2
6107	D4
6108	B2
6109	B2
6110	B4
6201	A10
6202	A10
6203	A10
6204	All
6310	A7
6401	A6
6402	A6
7000	B10
7001	C10
7002	B6
7011	A4
7101	B1
7200	A10
7202	A6
7203	A8
7401	A4
7402	A3
F001	C14
F002	C14
F003	A13
F004	A13
F005	B11
F006	C8
F007	C11
F008	***D8***
F009	B12
F010	C12
F011	***C7***
F012	***C11***
F013	***B10***
F014	B10
F015	C9
F016	B6
F017	B6
F018	B6
F019	B5
F020	B5
F021	D4
F022	C2
F023	B4
F024	A5
F025	B4
F026	B3
F027	A7
F028	A1
F029	C1
F030	D1
F031	D2
F032	D1
F033	C1
F034	C1
F035	B1
F036	C1
F037	C1
F038	A4
F039	C2
F040	B1
F041	A3
F042	A3
F043	A1
F044	B1
F045	B3
F046	C1
F047	B1
F048	B1
F049	A2
F050	A1
F051	B1
F052	A1
F053	A2
F054	A1
F055	A2
F056	A1
F057	D1
F058	A1
F059	A5
F060	A10
F061	All
F062	A11
F063	A8
F064	A8
F065	A7
F066	A7
F067	***A5***
F068	A7
F069	***A5***
F070	D9
F071	***D10***
F072	***A9***
F073	***A9***
F074	C11
F996	D1
F997	D1
F998	D1
F999	D1
I101	B13
I102	C13
I103	A13
I104	B13
I105	C13
I106	C13
I107	D12
I108	B8
I109	B12
I111	B9
I112	C8
I113	B10
I114	B9
I115	D8
I116	D8
I117	D11
I118	D10
I120	C9
I121	D11
I122	C11
I1221	A4
I1222	A3
I1223	A2
I1224	A9
I1225	D4
I123	D9
I124	B10
I125	C10
I127	D10
I128	D10
I129	D10
I130	B6
I131	C10
I132	C10
I133	D10
I134	C10
I135	C11
I136	C10
I137	C10
I138	C9
I139	C11
I141	B5
I142	B4
I143	B4
I144	B3
I145	B5
I146	B5
I147	A5
I148	C5
I149	D4
I150	D4
I151	C3
I152	A2
I153	C4
I154	B2
I155	C2
I156	D2
I157	B2
I158	D2
I159	D5
I160	C5
I161	B1
I162	B1
I163	B1
I164	B1
I165	A2
I166	B2
I167	B2
I168	B2
I169	A6
I170	A5
I171	A5
I172	B5
I173	A4
I174	A4
I175	B6
I176	B8
I177	A7
I178	A10
I179	A10
I180	C10
I201	B12
I202	B11
I204	A9
I206	A10
I207	A10
I208	A11
I209	A8
I210	A7
I211	A4
I212	A7
I213	A8
I214	A7
I215	A8
I216	A5
I217	A6
I218	A5
I219	A6
I220	A6
I221	A4
I222	A3
I223	A2
I224	A9
I225	D4



NOTE: SERVICE TESTPOINTS ARE ACCENTUATED BY ⌀ SYMBOL AND BOLD IN MAPPING

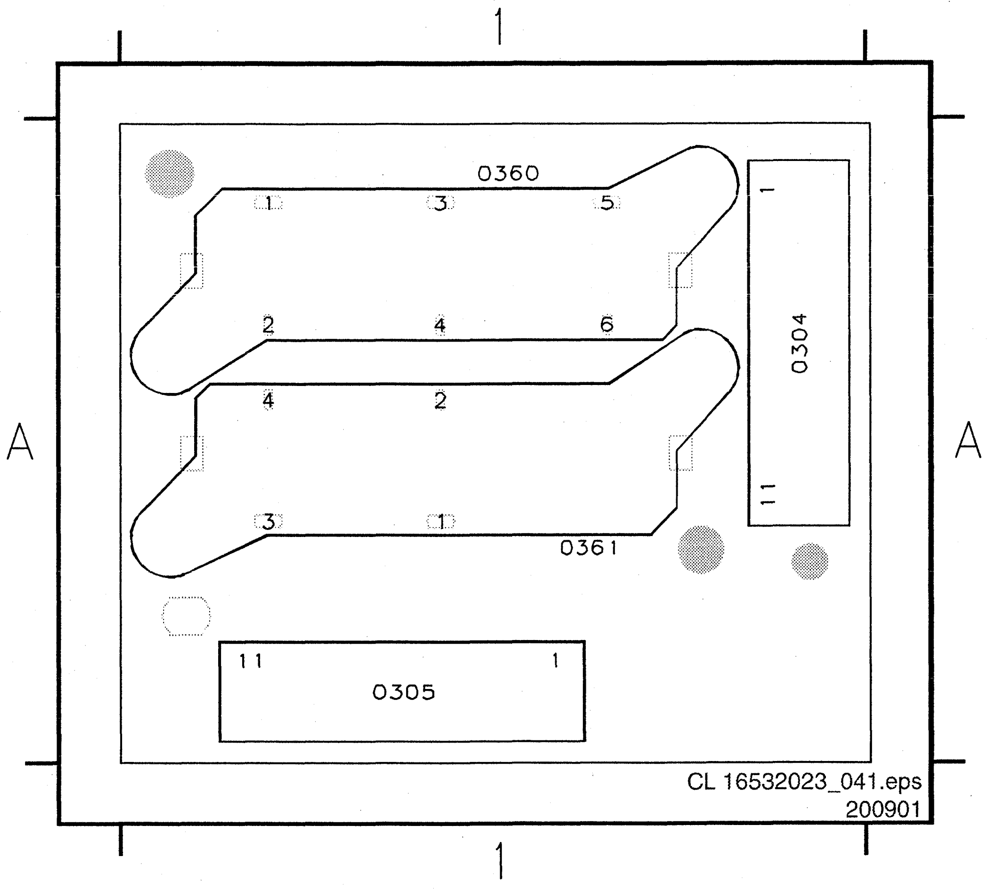
CL 16532023_039.eps
250901

SD-Connector


SD
SD-CONNECTOR
(Europe only)
DVD CINCH INPUTS
0360-C
YKC21-5637
Y
0360-B
YKC21-5637
PB
0360-A
YKC21-5637
PR
0361-A
YKC21-5620
L
0361-B
YKC21-5620
R
0V0
6001
6002
6003
6004
6005
6006
6007
6008
6009
6010
BZM55-C33
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
3002
3003
3004
75R
3005
1K
3006
3K3
3007
33K
3008
10K
3009
1K
3010
3K3
3011
33K
3012
10K
2006
100p
2010
100p
Y_SD
PB_SD
PR_SD
SNDL_SD
SNDR_SD
0304 EH-S
0305 EH-S
0V0
8V8
3V6
3V1
TO AV304
AV6
YPBPR-YUV-MATRIX
TO AV305
AV8
AUDIO+CONTROL
A
B
C
D
1
2
3
4
5
6
7
8
CL 16532023_040.eps
250901

0304	A7
0305	C7
0360-A	B1
0360-B	B1
0360-C	A1
0361-A	C1
0361-B	C1
1001	A2
1002	A2
1003	A2
1004	B2
1005	B2
1006	B2
1007	C2
1008	C2
1009	C2
1010	C2
1011	A4
1012	A4
1013	B4
1014	C4
1015	C4
1016	C6
1017	C6
1018	B6
1019	D6
2006	C4
2010	C4
3002	A3
3003	B3
3004	B3
3005	C4
3006	C5
3007	C3
3008	C5
3009	C4
3010	C5
3011	C3
3012	C5
3999	D1
6001	A2
6002	A3
6003	B2
6004	B2
6005	B2
6006	B2
6007	C2
6008	C2
6009	C2
6010	C2
F998	D1
F999	D1

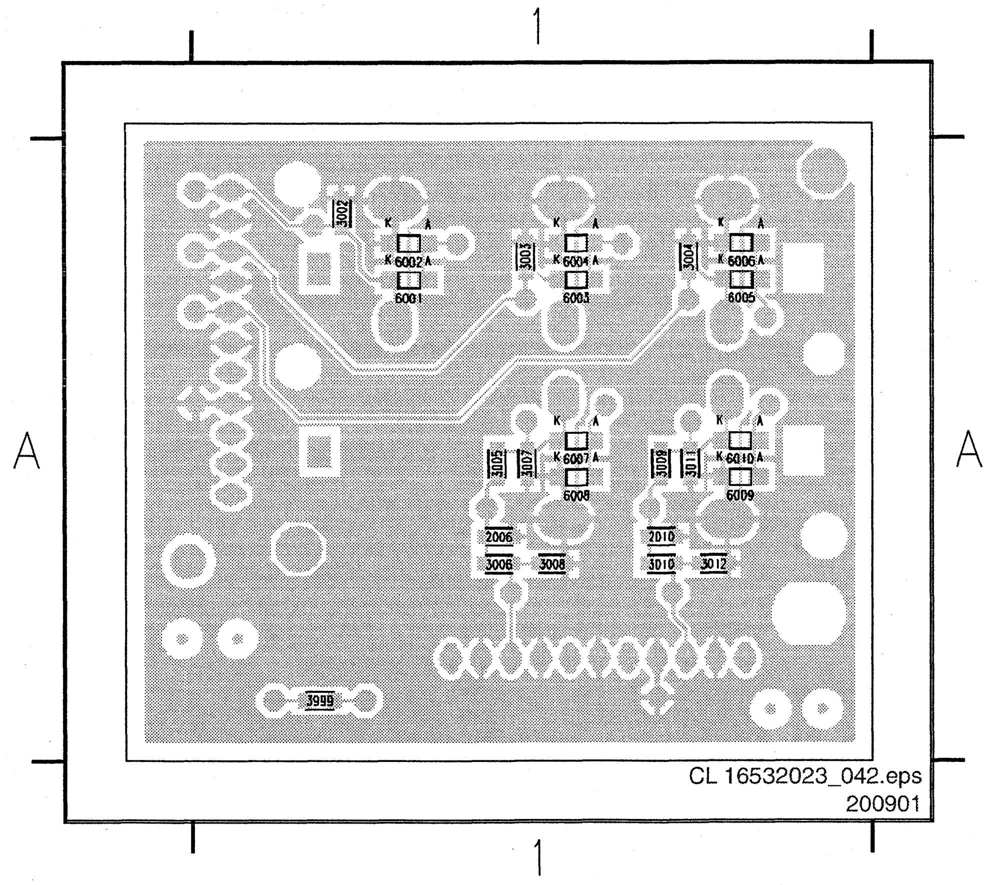
Layout SD-Connector (Top Side)


1
A
0360
1
3
5
2
4
6
4
2
3
1
0361
0304
1
11
0305
11
1

CL 16532023_041.eps
200901

0304	A1
0305	A1
0360	A1
0361	A1

Layout SD-Connector (Bottom Side)


1
A
3002
3003
3004
3005
3006
3007
3008
3009
3010
3011
3012
2006
2010
3999
6001
6002
6003
6004
6005
6006
6007
6008
6009
6010
K
A

CL 16532023_042.eps
200901

2006	A1
2010	A1
3002	A1
3003	A1
3004	A1
3005	A1
3006	A1
3007	A1
3008	A1
3009	A1
3010	A1
3011	A1
3012	A1
3999	A1
6001	A1
6002	A1
6003	A1
6004	A1
6005	A1
6006	A1
6007	A1
6008	A1
6009	A1
6010	A1

Personal Notes:

Personal Notes:

8. Electrical Alignments

Index of this chapter:
1. General Alignment Conditions
2. Hardware Alignments
3. Software Alignments
4. Option Settings

Notes:
- The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the CURSOR UP, DOWN, LEFT AND RIGHT keys of the remote control transmitter.
- Figures below can deviate slightly from the actual product, due to different set designs.

8.1 General Alignment Conditions

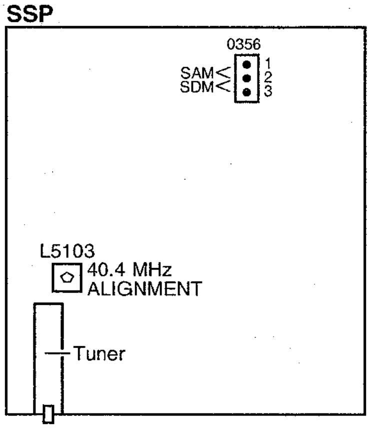
Perform all electrical alignments under the following conditions:
- Power supply voltage: 230 V_ac ± 10%, 50 Hz ± 5%.
- Allow the set to warm up for approximately 20 minutes.
- Voltages and waveforms are measured in relation to tuner earth (with exception to the voltages on the primary side of the power supply).
  Caution: never use heatsinks as ground.
- Test probe: Ri > 10 Mohm, Ci < 20 pF.

Before performing any alignments, set the receiver box to the following settings:
- Dynamic contrast: OFF (via the PICTURE menu).
- Active control: OFF (via the remote control. The ACTIVE CONTROL key is the key between the smart keys, and toggles Active Control ON and OFF).
- Smart Picture mode: ECO.

8.2 Hardware Alignments

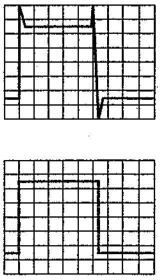
8.2.1 40.4 MHz Neighbour-channel Sound Trap Alignment

1. Tune to a checker board test pattern (system PAL B/G with a carrier frequency of 475.25 MHz).
2. Connect an oscilloscope to pin 19 (CVBS out) of the SCART1 connection and trigger line frequent.
3. Align the coil L5103 (diagram K1) completely downwards (see figure "SSP topview").
4. Align the coil upwards untill under- and overshoot arise at the black/white and white/black transitions in the video signal (see figure "Waveform sound trap alignment").
5. Align the coil downwards again, untill above mentioned under- and overshoot just disappears.



CL 86532057_004a.AI
240798

Figure 8-1 SSP top view



CL 86532057_006.AI
170798

Figure 8-2 Waveform sound trap alignment

8.3 Software Alignments

Notes:
- Alignments are stored automatically
- Dealer option settings are stored automatically
- Service option settings must be stored with the STORE OPTIONS item in the top level SAM menu. It is **not** necessary to turn the receiver box OFF and back ON in order to store the values in NVM.

Put the set in SAM mode (see chapter 5). Now you can select the following alignments:
- GENERAL:
  - LUMA GAIN
  - IF AFC
  - TUNER AGC
  - IF AFC TUNER 2
  - TUNER AGC TUNER 2
  - BLEND INTENSITY
  - FBX TEST PATTERN
- DRIVE:
  - TEST PATTERN
  - RED
  - GREEN
  - BLUE
  - RED BL OFFSET
  - GREEN BL OFFSET
  - CONTRAST
- LUM. DEL:
  - LUM. DELAY PAL BG
  - LUM. DELAY PAL I
  - LUM. DELAY SECAM
  - LUM. DELAY BYPASS

8.3.1 GENERAL Alignments

LUMA GAIN
This item has a fixed value of "3" (for EU/AP).

IF AFC
Connect the RF output of a video pattern generator to the antenna input.
From the generator, supply a PAL B/G TV signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz.

Alignment procedure:
1. Go to the INSTALL menu.
2. Select MANUAL INSTALLATION.
3. Tune the TV-set to the system and frequency described above via SEARCH - 475.00 - OK.

4. If the frequency shown in the FINE TUNE line (after the SEARCH is completed) is between 475.18 MHz and 475.31 MHz, you do **not** need to realign the IF AFC.
5. If the frequency lies outside this range, adjust the frequency in the FINE TUNE line to 475.25 MHz and STORE the program (this is **very important** because this will disable the AFC algorithm).
6. Navigate to the SAM main menu and select ALIGNMENTS - GENERAL - IF AFC.
7. During the IF AFC parameter adjustment, there is OSD feedback at the top of the screen.
8. This OSD feedback will contain one of four messages:

Table 8-1 AFC Alignment feedback

AFC-window	AFC-frequency versus reference
Out	High
In	High
In	*Low*
Out	Low

The first item (IN or OUT) informs you whether you are in or out of the AFC window. The second item (HIGH or LOW) informs you whether the AFC frequency is too high or too low.

1. Adjust the IF AFC parameter until the first value is within the AFC window (= IN).
2. Next, adjust the IF AFC parameter until the second value is LOW.
3. After adjustment, STORE the value.
4. Return to the INSTALL menu.
5. Select MANUAL INSTALLATION - SEARCH - 475.00 - OK and STORE. This will turn the AFC algorithm ON again.

Service tip: If you do not trust the frequency accuracy of your service generator, connect it to a "good" TV set and check it with the FINE TUNE line.

IF LPRIME AFC

Same procedure as described above but with other signal source (SECAM L').

TUNER AGC

1. Connect the RF output of a video pattern generator to the antenna input.
2. From the generator, supply an PAL B/G TV signal with a signal strength of approximately 2 mV and a frequency of 475.25 MHz.
3. Measure the DC voltage on pin 1 of the Tuner (item 1102). You can adjust this voltage by adjusting the TUNER AGC item in the SAM menu. Alignment is correct when the DC voltage is just below 3.8 V.

General remark for alignments related to the DW module (M):

The next two alignments are not stored in the main set NVM, but in the DW module NVM (IC 7991).

The NVM protect line of this IC is not controlled by the main set microprocessor.

Therefore, before performing any DW module alignments, one needs to temporarily bridge (with soldered wire) the test lead of pin 7 of the DW module NVM (IC 7991) with the test lead 5 mm diagonally across (just under resistor 5502). This will disable the protect line of the DW module NVM.

Important: Remove the wire bridge after storing the values.

IF AFC TUNER 2

Use the same procedure as described above (under IF AFC) with the set switched to the DW source.

TUNER AGC TUNER 2

Use the same procedure as described above (under TUNER AGC) with the set switched to the DW source.

BLEND INTENSITY

This adjustment aligns the level of transparency of the menu display that is blended into the main display. Use this alignment when the main microprocessor or the HOP IC is replaced.

1. Set the BRIGHTNESS, CONTRAST, and COLOR values (in the PICTURE menu) at the midpoint.
2. Using a video pattern generator, apply a signal with a 100% white video pattern to the set.
3. Connect an oscilloscope to the "Red" output of the Receiver box (pin 1 of the MONITOR OUT sub-D connector) and measure the Red output level.
4. Align the BLEND INTENSITY parameter so that the blended signal is 65 % of the black/white amplitude. This ratio will be about 0.45 V (blended signal) to 0.7 V (full white signal).

FBX TEST PATTERN

When this pattern is switched on, the set will display a picture that slowly changes from black to white, and vice versa. Use this pattern to check the functionality of the circuitry behind the FBX and the FBX function itself.

You can also use this pattern as a picture generator for the Flat TV plasma monitor (for example, for checking cell defects, interpretation of the ADC/DAC converters, etc).

Important: Be sure to set this pattern to OFF again when it is no longer needed, since it will not be automatically disabled when SAM is exited.

8.3.2 DRIVE Alignments

TEST PATTERN

The TEST PATTERN is not really needed for the alignment of the Receiver box. It can be used in the TV configuration as a test pattern to align the white colour temperatures of the monitor. However, the monitor itself (as a stand alone unit) can also be aligned in other ways (described in the Service Manual of the TV monitor).

RGB Output Amplitude Adjustment

1. Load the RGB output (sub-D connector AV303) of the Receiver box with a TV monitor (or match RGB output lines with 75 ohm resistors, if no monitor is available), and measure the outputs with an oscilloscope.
2. Apply an artificial white CVBS signal (1 V_pp white-to-top-sync, with a 0.3 V sync amplitude) to the external 2 input.
3. Set LUMA GAIN to a value of "3" (via the SAM menu ALIGNMENTS - GENERAL).
4. Set RED, GREEN, and BLUE to "24" (via the SAM menu ALIGNMENTS - DRIVE).
5. Set RED BL OFFSET and GREEN BL OFFSET to "7".
6. Adjust the gain (with the RED, GREEN, and BLUE slider bars) until the oscilloscope-measured values for R, G, and B are 700 mV ± 10 mV with respect to the front porch of the signal.

8.3.3 LUM. DELAY Alignments

With this alignment, you place the luminance information directly on the chrominance information (brightness is pushed onto the colour). Input a colour bar or grey scale pattern as a test signal.

LUM. DELAY PAL BG

Set value to "12". If the luminance signal referred to the chrominance signal still has a time delay, adjust the value to solve this.

LUM. DELAY PAL I

Set value to "12". If the luminance signal referred to the chrominance signal still has a time delay, adjust the value to solve this.

LUM. DELAY SECAM
Set value to "11". If the luminance signal referred to the chrominance signal still has a time delay, adjust the value to solve this.

LUM. DELAY BYPASS
Set value to "10". If the luminance signal referred to the chrominance signal still has a time delay, adjust the value to solve this.

8.4 Option Settings

8.4.1 Introduction

The microprocessor communicates with a large number of (I2C) ICs in the set. To ensure good communication and make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence or absence of specific ICs or functions is made known by means of the option codes.

All options codes can be manipulated using both the Option Numbers and/or the Option menu.
All *hardware* related options are incorporated under the heading SERVICE OPTIONS in the SAM main menu.
All *software* related options are incorporated under the heading DEALER OPTIONS in the SAM main menu.
After you have changed the option(s), save them via the STORE OPTIONS command. The new option setting is only active after the TV is switched OFF and ON again via the mains switch (the EAROM is then read again).

8.4.2 Dealer Options

Select this sub-menu to set the initialisation codes (= options) of the set via text menu's.

Menu name	Subjects	Options	Physically in set
Personal Options	Picture Mute	Yes	Video mute active when there is no signal detected
		No	Noise when there is no signal detected
	Virgin Mode	Yes	TV starts up with language selection menu
		No	TV does not start up with language selection menu
	Auto Store Mode (for EU)	None	Auto Store mode disabled (not in installation menu)
		PDC-VPS	Auto Store mode via ATS (Automatic Tuning System) enabled
		TXT page	Auto Store mode via ACI (Automatic Channel Installation) enabled
		PDC-VPS-TXT	Auto Store mode via ATS or ACI enabled
	Txt Preference (for EU)	FLOF	Preference to FLOF (Full Level One Features) teletext
		TOP	Preference to TOP (Table Of Pages) teletext
Note: Above overview gives the menu items for all regions (EU/AP/US). The correct settings differs per region (see Option Numbers).			

CL 36532021_014.eps
310303

Figure 8-3 Dealer options overview

8.4.3 Service Options

Select this sub-menu to set the initialisation codes (= options) of the set via text menu's.

Menu -item	Subjects	Options	Description
Chassis region	Region (for EU)	Europe	Setting for Europe
		AP	Setting for AP PAL-multi
Dual Screen	PIP/Dual Screen	Yes	Feature present
		No	Feature not present
	TXT/EPG Dual Screen (for EU)	Yes	Feature present
		No	Feature not present
Teletext	Flash RAM (for EU)	Yes	Flash RAM present
		No	Flash RAM not present
	NexTView (for EU)	2	EPG level 2 setting
		2C3	EPG level 3 setting
Monitor type	Monitor	F19	Receiver-box can operate with 42" F19D-monitor, when jumper settings on AVI-panel are configured in 1.9-mode
		FM23	Receiver-box can operate with 32" FM23-monitor, when jumper settings on AVI-panel are configured in 2.3-mode
		FM24 (SL)	Receiver-box can operate with 42" FM24-monitor, when jumper settings on AVI-panel are configured in 2.3-mode (SL= Speaker Less)
		FM25-SL	Receiver-box can operate with 50" FM25-monitor, when jumper settings on AVI-panel are configured in 2.3-mode (SL= Speaker Less)
		FM26 (SL)	Receiver-box can operate with 42" FM26-monitor, when jumper settings on AVI-panel are configured in 2.3-mode (SL= Speaker Less)
Video repro	Featurebox type	Eagle	Eagle present (Pixel Plus)
		Falconic	Eagle not present (no Pixel Plus)
	Light sensor	Yes	Feature present
		No	Feature not present (for FTV1.9 and FM25-SL monitors only)
	2D Combfilter	Yes	Feature present
		No	Feature not present
	3D Combfilter	Yes	Feature present (for US only)
		No	Feature not present
	Picture improvement	Yes	LTP (TOPIC) present
		No	LTP (TOPIC) not present
	Auto scavem	Yes	Feature present
		No	Feature not present
	Pixel Plus	Yes	Feature (Eagle) present
		No	Feature (Eagle) not present
	Signalling bits	Yes	For 16:9 sets
		No	For 4:3 sets
Miscellaneous	Home Cinema (for EU)	Yes	Set with Home Cinema link
		No	Set without Home Cinema link
	Integrated Cinema (for EU)	Yes	Feature present
		No	Feature not present
	Stand Alone	Yes	Option needed for Service to be able to service the receiver-box with a normal PC monitor
		No	Default setting. In this setting, the receiver-box will go to Standby when connected to PC monitor
Opt. No.	Group 1		e.g. 04492 08449 49555 04112 (see sticker on bottom receiver-box)
	Group 2		e.g. 04151 00000 00000 00257 (see sticker on bottom receiver-box)
Note: Above overview gives the menu items for all regions (EU/AP/US). The correct settings differs per region (see Option Numbers).			

CL 36532021_015.eps
010503

Figure 8-4 Service options overview

8.4.4 Option Numbers

Select this sub-menu to set all options at once (expressed in two long numbers).

An option number (or 'option byte') represents a number of different options. When you change these numbers directly, you can set all options very fast. All options are controlled via eight option numbers.

Example: The sticker on the bottom cover of an E-box gives the following option numbers:
20811 48897 49619 04113
04119 00001 00000 00271
The first line (group 1) indicates options 1 to 4, the second line (group 2) options 5 to 8 (see tables below).

Every 5-digit number represents 16 bits (so maximum number can be 65536 if all options are set).
When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number.

OB	Bit	Option name	Settings (in decimal values) for F22Rx_AA chassis		Option number
1	0	Featurebox	0= None	2= Prozonic 3= Eagle (EU/US) 4= Falconic 5= Falconic *1050i 1250i*	Sum OB1 (decimal)
	1				
	2				
	3	2D Comb Filter	0= Off	8= On (EU/US)	
	4	Auto-Scavem	0= Off (EU/US)	16= On (not appl. for FTV)	
	5	Field Memory	0= Off (EU/US)	32= "for future use"	
	6	Light Sensor	*0= Off (for FTV1.9 and FM52)*	64= On (for the rest)	
	7	Luma Trans. Proc.	0= Off (EU/US)	128= On (for non-Eagle sets)	
	8	PICNIC	0= Off	256= On (EU/US)	
	9	n.a. *	0		
	10	n.a. *	0		
	11	LNA	0= Off (EU/US)	2048= On (not appl. for FTV)	
	12	WSS	0= Off (US)	4096= On (EU)	
	13	3D Comb Filter	0= Off (EU)	8192= On (US)	
	14	Pixel Plus	0= Off	16384= On (EU/US)	
	15	720p	0= Off (EU/US)	32768= On (not appl. for FTV)	
2	0	Headphone	0= Off	1= On (EU/US)	Sum OB2 (decimal)
	1	Dolby ProLogic	0= Off (EU/US)	2= On	
	2	Virtual Rear Spkrs	0= Off (EU/US)	4= On	
	3	Cordless Rear Spkrs	0= Off (EU/US)	8= On	
	4	Dolby Digital	0= Off (EU/US)	16= On	
	5	Virtual Dolby	0= Off (EU/US)	32= On	
	6	Subwoofer	0= Off (EU/US)	64= Type 1 (not appl. for FTV)	
	7			128= Type 2 (not appl. for FTV)	
	8	Chassis	0= EM6 (not appl. for FTV)	256= EM5 (not appl. for FTV)	
	9			512= EM3 (not appl. for FTV)	
	10				
	11			3840= Others (EU/US)	
	12	EPG Type	0= Off (US)	8192= On (EU)	
	13	Flash RAM	0= Off (US)	8192= On (EU)	
	14	EPG Version	0= Off (US)	16384= Text guide only	
	15			32768= NexTView 2C3 (EU) 49152= NexTView 2	
3	0	AV3	0= Off	1= On (EU/US)	Sum OB3 (decimal)
	1	AV4	0= Off	2= On (EU/US)	
	2	AV4 (2fH)	0= Off (EU/US)	4= On	
	3	AV3 (2fH)	0= Off (EU/US)	8= On	
	4	Dual Screen	0= Off (US)	16= On (EU)	
	5	n.a. *	0		
	6	TXT/EPG/DS	0= Off (US)	64= On (EU)	
	7	Aux. Headphone (DW)	0= Off	128= On (EU/US)	
	8	Aspect Ratio	0= 4:3 (not appl. for FTV)	256= 16:9 (EU/US)	
	9	Tilt	0= Off (EU/US)	512= On (not appl. for FTV)	
	10	DAF	0= Off (EU/US)	1024= On (not appl. for FTV)	
	11	Integrated Radio	0= Off (EU/US)	2048= On (not appl. for FTV)	
	12	Stand Alone	0= Off (for customer)	4096= On (for service)	
	13	Integrated DVD	0= Off (EU/US)	8192= On (not appl. for FTV)	
	14	Home Cinema	0= Off (US)	16384= On (EU)	
	15	Integrated RC (P50)	0= Off (US)	32768= On (EU)	
4	0	Aux. Tuner (DW)	0= Off	1= On (EU/US)	Sum OB4 (decimal)
	1	n.a. *	0		
	2	China IF	0= Off (EU/US)	4= On	
	3	Tuner	0= Philips	8= Alps	
	4	Teletext	0= Off (US)	16= On (EU)	
	5	China Teletext	0= Off (EU/US)	32= On	
	6	Closed Caption	0= Off (EU)	64= On (US)	
	7	n.a. *	0		
	8	Digital Module (MILO)	0= Off (EU/US)	256= On (not appl. for FTV)	
	9	Integrated Harddisk	0= Off (EU/US)	512= On (not appl. for FTV)	
	10	n.a. *	0		
	11	n.a. *	0		
	12	Anti Aging	0= Off	4096= On (EU/US)	
	13	DVD-door lock	0= Off (EU/US)	8192= On (not appl. for FTV)	
	14	n.a. *	0		
	15	n.a. *	0		

Note: Bits that are not used have a fixed value of "0", and are not mentioned in above overview.

CL 36532030_018.eps
170403

Figure 8-5 Option bytes Group 1

OB	Bit	Option name	Settings (in decimal values) for F22Rx_AA chassis		Option Number
5	0	Auto TV	0= Off	1= On (EU/US)	Sum OB5 (decimal)
	1	Auto Store Mode	0= None	2= PDC/VPS 4= TXT Page 6= PDC/VPS/TXT Page	
	2				
	3	Korean Stereo	0= Off (EU/US)	8= On	
	4	Picture Mute	0= Off	16= On (EU/US)	
	5	Demo	0= Off (EU/US)	32= On	
	6	Virgin	0= Off (EU/US)	64= On	
	7	n.a. *	0		
	8	n.a. *	0		
	9	n.a. *	0		
	10	n.a. *	0		
	11	n.a. *	0		
	12	TXT Preference	0= TOP (US)	4096= FLOF (EU)	
	13	n.a. *	0		
	14	n.a. *	0		
	15	n.a. *	0		
6	0	P50 DVD menu-line	0= Off (US)	1= On (EU)	Sum OB6 (decimal)
	1	n.a. *	0		
	2	n.a. *	0		
	3	n.a. *	0		
	4	Region	0= EU	16= AP PAL-multi 32= AP NTSC 48= US 64= LATAM 80= Australia	
	5				
	6				
	7				
	8	n.a. *	0		
	9	n.a. *	0		
	10	n.a. *	0		
	11	n.a. *	0		
	12	n.a. *	0		
	13	n.a. *	0		
	14	n.a. *	0		
	15	n.a. *	0		
7	0	AV4 1fH	0= Off (EU/US)	1= On (not appl. for FTV)	Sum OB7 (decimal)
	1	AV 2fH 1	0= Off (EU/US)	2= On (not appl. for FTV)	
	2	AV 2fH 2	0= Off (EU/US)	4= On (not appl. for FTV)	
	3	AV VGA	0= Off (EU/US)	8= On (not appl. for FTV)	
	4	AV DVI	0= Off (EU/US)	16= On (not appl. for FTV)	
	5	n.a. *	0		
	6	n.a. *	0		
	7	n.a. *	0		
	8	AV 1fH	0= Off (EU/US)	256= On (not appl. for FTV)	
	9	AV 2fH 1	0= Off (EU/US)	512= On (not appl. for FTV)	
	10	AV 2fH 2	0= Off (EU/US)	1024= On (not appl. for FTV)	
	11	AV VGA	0= Off (EU/US)	2048= On (not appl. for FTV)	
	12	AV DVI	0= Off (EU/US)	4096= On (not appl. for FTV)	
	13	n.a. *	0		
	14	n.a. *	0		
	15	n.a. *	0		
8	0	Cabinet	0= (not appl. for FTV)	1 - 14= (not appl. for FTV) 15= Other (EU/US)	Sum OB8 (decimal)
	1				
	2				
	3				
	4	SLDP	0= Off (EU/US)	16= On (not appl. for FTV)	
	5	n.a. *	0	n.a. *	
	6	AVL	0= Off (EU/US)	64= On	
	7	n.a. *	0	n.a. *	
	8	FTV Monitor (auto detect)	0= FTV1.9	256= FM23 (default) 512= FM24 768= FM24-SL 1024= FM25-SL 1280= FM26 1536= FM26-SL 1792= FM27 2048= FM27-SL 65280= Other	
	9				
	10				
	11				
	12				
	13				
	14				
	15				

Note: Bits that are not used have a fixed value of "0", and are not mentioned in above overview.

CL 36532030_019.eps
170403

Figure 8-6 Option bytes Group 2

Note: If the EAROM is replaced, all the options will require resetting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. These numbers can be found on the bottom of the Receiver box.

9. Circuit Descriptions, List of Abbreviations, and IC Data Sheets

Index of this chapter:

1. Introduction
2. Power Supply Unit (PSU)
3. Audio Video Interface panel (AVI)
4. Small Signal Panel (SSP)
5. Double Window panel (DW)
6. Front panel (FP)
7. High Definition panel (HD)
8. Auto TV
9. Abbreviations
10. IC Data sheets

Note:

- Figures can deviate slightly from the actual product, due to different set designs.
- For a good understanding of the following circuit descriptions, please use the diagrams in chapter 6 and 7. Where necessary, you will find a separate drawing for clarification.

9.1 Introduction

This Receiver box (or E-box) is developed for the global market. The service chassis name is F22Rx (x stands for the region; e.g. E=Europe, U= USA), with the following features:

- Feature box 7 for Pixel Plus. Not all Pixel Plus features can be used with a **matrix** (plasma/LCD) display. Features like increased lines/field and pixels/line are not possible. However, features like LTI, improved Natural Motion, and colour dependant peaking are implemented.
- Improved Tuner / Splitter (less noise).
- Without Down Scaler panel (so no "VGA and HD in Double Window" possible).

It can drive both FTV1.9 and FM2x plasma screens.

9.2 Power Supply Unit (PSU, diagram PS)

9.2.1 PSU: Introduction

A 35 W Power Supply is used in the Receiver box. It supports a range of input voltages (= global), and can be used for almost every E-box version. It delivers the voltages for the SSP, the DW, the FBX (+5VSTB, 5V2, 8V6, 7V7, -7V7 and 33V), and for the specific PWBs. The output of the power supply is connected to the AVI panel. This panel then powers all the other PWBs.

The Mains voltage is applied to the input filter that feeds it to the standby supply. This supply is always operational and delivers the +5VSTBY voltage.

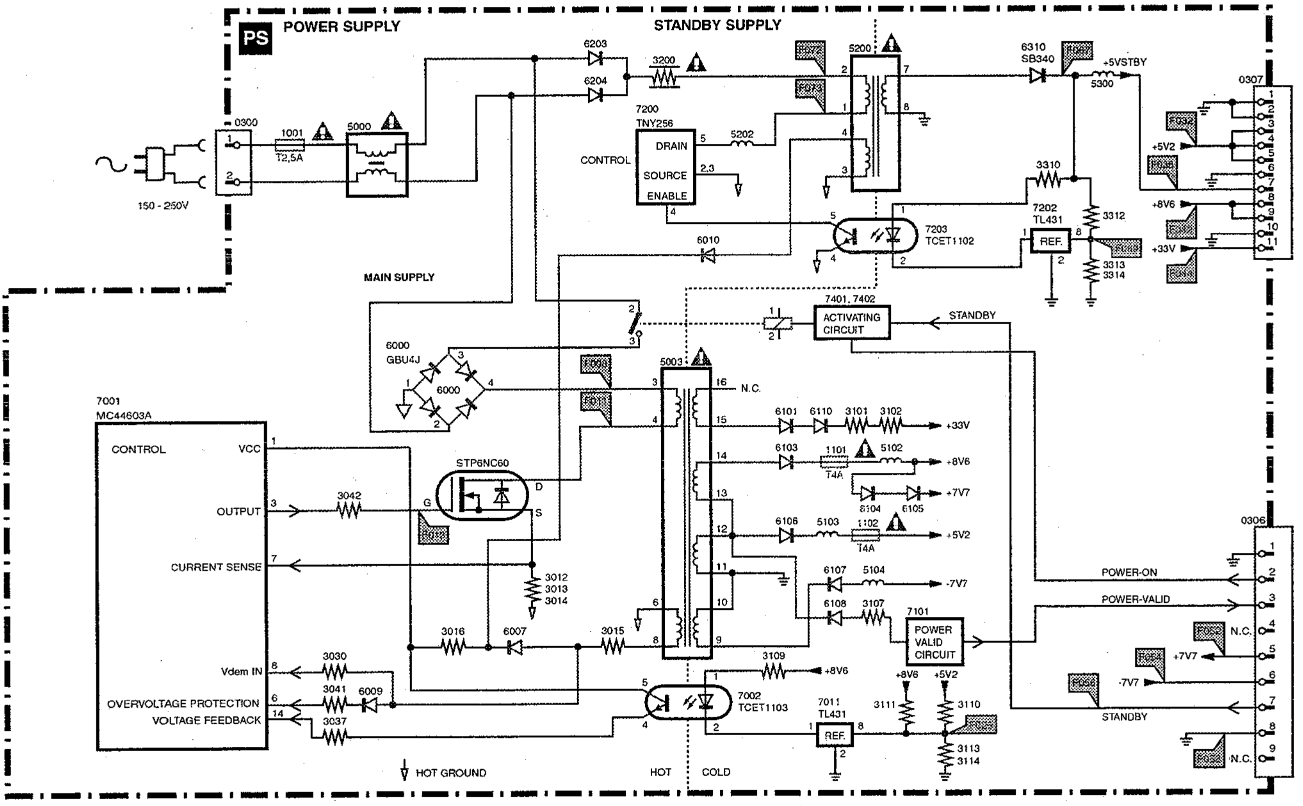
The task of the main supply is to deliver the supply voltages for the several electrical circuits in the Receiver box. It is switched via a single-pole relay, which is powered from the +5VSTBY voltage and controlled via the POWER_ON and STANDBY signals.

The reason to choose for a separate standby supply, instead of a single flyback supply (which can be driven in standby mode like a MC44604), is the requirement to have a very low standby power consumption.

The "POWER ON/STBY" knob is located on the Front I/O panel and activates the relay supply (POWER_ON). The microprocessor is then able to switch the set from "standby" to "on" (STANDBY).

The green "POWER ON" LED is active, when the 8.6 V is present (HW controlled).

The red "STANDBY" LED is active in standby. The OTC controls this via ON_OFF_LED.


PS
POWER SUPPLY
STANDBY SUPPLY
MAIN SUPPLY
0300
1001
T2,5A
5000
150 - 250V
6203
6204
3200
7200
TNY256
CONTROL
DRAIN
SOURCE
ENABLE
5202
5200
6310
SB340
+5VSTBY
5300
0307
3310
7202
TL431
REF.
3312
3313
3314
7203
TCET1102
6010
+5V2
+8V6
+33V
7401, 7402
ACTIVATING CIRCUIT
STANDBY
6000
GBU4J
5003
N.C.
7001
MC44603A
CONTROL
VCC
OUTPUT
CURRENT SENSE
Vdem IN
OVERVOLTAGE PROTECTION
VOLTAGE FEEDBACK
STP6NC60
3042
3012
3013
3014
3016
6007
3015
3030
3041
6009
3037
6101
6110
3101
3102
+33V
6103
1101
T4A
5102
+8V6
6104
6105
+7V7
6106
5103
1102
+5V2
6107
5104
-7V7
6108
3107
7101
POWER VALID CIRCUIT
3109
7002
TCET1103
7011
TL431
3111
3110
3113
3114
0306
POWER-ON
POWER-VALID
N.C.
STANDBY
HOT GROUND
HOT
COLD

CL 16532098_003.EPS
150801

Figure 9-1 Block Diagram Power Supply

The Power Supply module consists of three parts:

1. Mains voltage inlet and filter.
2. Standby supply.
3. Main supply.

The total power balance of the supply can be read from the following table:

Table 9-1 Total power balance

Supply	Value (V)	Tolerance (%)	Typ. Current (A)	P_max (W)
5V2	5.2	3	2.0	13
8V6	8.6	7	1.25	13.8
+7.7V_audio	8.6	7	0.1	1.2
-7.7V_audio	-5.2	7	0.1	1.2
33V_tuner	33		4 mA max.	0.1
5VSTB	5.32	5	0.3	2.7

9.2.2 PSU: Start-up Sequence

For a description of the "start-up sequence", we make a differentiation between the FTV1.9 and the FM2x monitors.

Start-up sequence for an E-box + FTV1.9 Monitor
There are five different "power states" in the E-box:

- **Low Power Standby (P < 0.9 W).** The Main supply is not working. Only the OTC and I/O Expanders (on the AVI-panel) are powered from the 5VSTB. The OTC works in one of the low power states (no program execution, but the UART, timer, RC pre-processor, and SW ADC are working).
- **Standby (P < 3 W).** The Main supply is not working. Only the OTC and I/O Expanders (on the AVI-panel) are powered from the 5VSTB. The OTC works in high power state (= normal).
- **Semi Standby (Europe only).** The Main supply is working. All PWBs are powered. The video in the HOP and the audio on the AVI board are muted. The sync is not send to the monitor. This state is used for EPG and P50 operations.
- **On (P < 35 W).** The Main supply is working. All PWBs are powered.
- **Off.** The OTC and I/O Expanders are not powered anymore. All the voltages are "off".

The E-box will always start-up in the "Standby" state until the CONFIG_IDENT is detected (means monitor attached). During initialisation, the E-box must check the "TV_standby" bit in the NVM, to decide into which state the E-box and monitor have to be put. This will set the STANDBY pin on the OTC accordingly.
The initialisation starts when the E-box is switched "on" and the AC-power is connected. As a result, the 5VSTB supply is activated, and the OTC is activated. Now, the OTC checks the presence of the CONFIG_IDENT signal:

- If this check is successful (this means two following "hand shake" sequences are detected), then the state of the E-box depends on the "TV_standby" bit in the NVM. This bit contains the history data about how previously the TV configuration entered the "standby" state (e.g. when this was done by the user (bit= 1), the set will stay in "standby").
- If this check is not successful, the E-box will go to "Low Power Standby".

Note: For service, the E-box can work in "Stand-alone" power mode. This is detected via the "Stand alone" bit in the NVM. This bit can be set in the Dealer/Service menu.

If the E-box is switched from "Standby" to "On", the STANDBY pin of the OTC is pulled "low", the relay switch is closed, and the main supply is started up. When the 5V2 and 8V6 voltages reach their nominal values, the 5V2_PROT and 8V6_PROT are activated. Now:

1. The MSP shall be reset first, as this IC can disturb the I2C traffic, when not reset properly.
2. Secondly, as the POPOV IC of the DW (F2R22 only) can pull the slow SDA line "low" when the HA signal from the main HIP is not available, all traffic on the slow I2C bus needs to be delayed until the HIP is properly initialised and settled. This means a wait state of 100 ms, after the crystal configuration of the HIP has correctly been read out.
3. Next, all other ICs are initialised. Now, the E-box is working, but the monitor is still not displaying a picture.
4. The HOP switches on the PHI1 loop, the software sets all the necessary video and audio parameters, and enables them.

Start-up sequence for an E-box + FM2x Monitor
There are five different "power states" in the E-box:

- **Low Power Standby (P < 0.9 W).** The Main supply is not working. Only the OTC, I/O Expanders (on the AVI-panel), and remote circuits are powered from the 5VSTB. The OTC works in one of the low power states (no program execution, but the UART, timer, RC pre-processor, and SW ADC are working).
- **Peripheral Standby (P < 3 W).** This is an intermediate state. This mode is only used temporarily, if the OTC goes from low power standby to normal operation and vice versa.
- **Semi Standby (Europe only).** The Main supply is working. All PWBs are powered. The video in the HOP and the audio on the AVI board are muted. The sync is not send to the monitor. This state is used for EPG and P50 operations.
- **On (P < 35 W).** The Main supply is working. All PWBs are powered.
- **Off.** The OTC and I/O Expanders are not powered anymore. All the voltages are "off".

The E-box will always start-up in the "Standby" state until the AYT (**A**re **Y**ou **T**here) is detected. This means that an FM2x monitor is attached (this is different from the FTV1.9 monitor, where a separate CONFIG_IDENT line is used). During initialisation, the E-box must check the "Stand_alone" bit in the NVM. If this bit and the "TV_standby" bit both are not set, the AYT protocol is started, and will wake up the monitor. This will set the STANDBY pin on the OTC accordingly.
The initialisation starts when the E-box is switched "on" and the AC-power is connected. As a result, the 5VSTB supply is activated, and the OTC is activated. Now, the OTC checks the presence of the "Standby" bit:

- If the "Standby" bit **and** the "Stand_alone" (or "Service/ Factory") bit are **not** set, the AYT protocol is enabled, which will wake up the monitor. If this check is successful, the state of the E-box depends on the "TV_standby" bit in the NVM. This bit contains the history data about how previously the TV configuration entered the "standby" state (e.g. when this was done by the user (bit= 1), the set will stay in "standby").
- If this check is not successful (e.g. set to standby by user), the E-box will go to "Low Power Standby".

Note: For service, the E-box can work in "Stand-alone" power mode. This is detected via the "Stand alone" bit in the NVM. This bit can be set in the Dealer/Service menu. If this bit is "high", the AYT protocol is not used and no FSP commands are send to the monitor.

If the E-box is switched from "Low Power Standby" to "On", the STANDBY pin of the OTC is pulled "low", the relay switch is closed, and the main supply is started up. When the 5V2 and 8V6 voltages reach their nominal values, the 5V2_PROT and 8V6_PROT are activated. Now:

1. The MSP shall be reset first, as this IC can disturb the I2C traffic, when not reset properly.
2. Secondly, as the POPOV IC of the DW (F22R only) can pull the slow SDA line "low" when the HA signal from the main

HIP is not available, all traffic on the slow I2C bus needs to be delayed until the HIP is properly initialised and settled. This means a wait state of 100 ms, after the crystal configuration of the HIP has correctly been read out.

3. Next, all other ICs are initialised. Now, the E-box is working, but the monitor is still not displaying a picture.
4. The HOP switches on the PHI1 loop, the software sets all the necessary video and audio parameters, and enables them.

9.2.3 PSU: Mains Voltage Inlet and Filter

The Mains voltage is provided by inlet 0300, after which it is fused by a T2.5A fuse. The next part, the Mains voltage filter, consists of an LC-common mode filter section. This filter consists of two capacitors (items 2002 and 2004) from both phase and neutral to ground (to reduce the leakage current) and an inductor (5000). Interferences on one of the phases are shorted to ground by these capacitors.
Inductor 5000 also provides a differential-mode filtering with capacitor 2001. Resistor 3003 discharges this capacitor after the Mains voltage is disconnected.

At high voltage peaks (for example, lightning surges) on one of the phases, the resistance of VDR 3002 will be very low, causing fuse 1001 to interrupt. At a lightning surge on both phases with respect to chassis ground, the Mains voltage filter will form a high resistance, through which the voltage will rise very sharply. To prevent flashovers, a spark gap (item 1000) is implemented.

Resistors 3000 and 3001 are connected between neutral and chassis ground. They are required by safety regulations.

9.2.4 PSU: Standby supply

Start up
The Standby Supply operates on the AC voltage from the input filter part, and has to deliver a stable regulated 5 V value. The standby supply is always operational when the AC input voltage is present, even when the POWER switch is in the "off" position.
After a small bridge rectifier and buffer capacitor (D6203/6204 and C2202), the DC voltage is applied to a switched mode power supply. To reduce self-pollution, the rectifiers are bridged by small capacitors (C2200/2201).

Normal Operation
The Standby Supply itself is build around a "TINYSwitch" TNY256. This IC contains the control circuitry and a power MOSFET needed for an Switched Mode Power Supply (SPMS). It uses a simple "on/off" control loop to regulate the output voltage.
The supply for the TNY256 comes via safety resistor R3200, L5200, and L5202.
The +5VSTBY voltage at the secondary side is rectified by D6310 and smoothed by C2311.

By using secondary sensing, a very accurate +5VSTBY voltage and high efficiency is achieved. The sensing circuit uses a TL431 as reference voltage/error amplifier. Optocoupler 7203 and coil 5200 are used for the Mains voltage isolation. When the +5VSTBY output voltage rises, the reference voltage on the TL431 will exceed 2.5 V and the current through this device and the optocoupler LED will increase. By this method, the optocoupler transistor will conduct more. When this current (at pin 4 of IC7200) exceeds 50 µA, the MOSFET is switched "off", and the output voltage will drop. When the current drops below 40 µA, the MOSFET is switched "on" again.

Output Voltage
+5VSTBY, which is available on connector 0307, pin 7.

Protections
As the TNY256 is sensitive for transients, a "peak clamp" circuit (300 V zener diodes 6201 and 6202) is used to limit the voltage to a safe level.

9.2.5 PSU: Main supply

Introduction
The main supply is activated by single-pole relay 1400, which delivers the filtered Mains voltage to a rectifier bridge (item 6000). This rectified voltage is the input for the flyback converter, which generates the output voltages.
The flyback converter is based on a MC44603AP driven in "discontinues conduction mode" with a fixed frequency of 40 kHz (at nominal Mains voltage voltages). The MC44603AP drives a MOSFET (600 V, 1.2 ohm), which is snubbered (by 2008) and clamped by an RCD peak clamp. The transformer delivers the secondary output voltages and the primary supply voltage for the IC.
Secondary voltage control is on the 5V2 and 8V6 output via a TL431 (item 7011) and an optocoupler (item 7002) back to the error amplifier input of the controller IC.

Output Voltages
The following voltages are generated by the **main** supply:

- +33V (0307/11) for the Tuner.
- +16V (0306/9).
- +8V6 (0307/8 & 9).
- +7V7 (0306/5).
- -7V7 (0306/6).
- +5V2 (0307/4 & 5).
- +5V2_FB (0307/3).

Start up

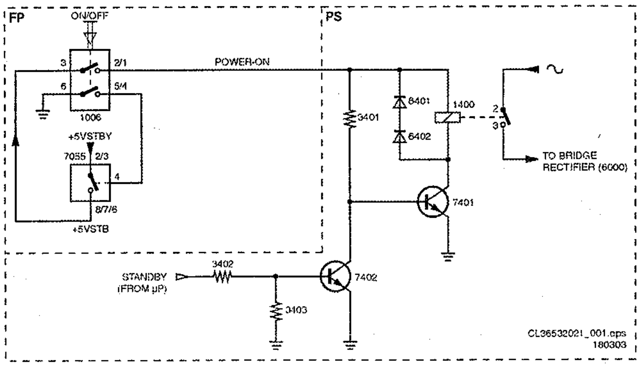


Figure 9-2 Start up circuitry

The mechanical "on/off" switch (item 1006) on the Front panel drives IC7055. This is a "power distribution switch", used due to the high switch-on current. It has internal overload and short-circuit protections.
A single pole 5 V relay (item 1400) will switch the Receiver box from "standby" to "on". It is controlled via the POWER_ON line.

The start up supply voltage of the control IC comes via the standby supply. It is rectified (D6010), smoothed (C2025), and clamped (D6008). Once the main supply is started, this voltage is taken over by winding 6-8 of transformer 5003 and diode D6007.

Normal operation
The working frequency of 40 kHz is determined by R3032 and C2014. The output voltage is controlled by duty cycle regulation. Output is on pin 3, which drives the FET. A current will flow through transformer coil 3-4 (item 5003), FET 7000, and sense-resistors R3012//R3013//R3014 to ground. The energy stored in the primary winding during the on time is delivered to the secondary windings during the "off" time.
The output voltages are rectified and buffered here.

Regulation is performed by the control loop that consists of reference component 7011 and optocoupler 7002. When the +5V2 output voltage rises, the reference voltage on the TL431 will exceed 2.5 V and the current through this device and the optocoupler LED will increase. By this method, the optocoupler transistor will conduct more, and the voltage over R3035 (and pin 14 of IC7001) will rise. The IC will adjust the duty cycle, the FET will conduct less, and the output voltage will decrease.

Protections

Soft Start and Maximum Duty Cycle

The output voltage is 0 V at start up. This would force IC 7001 to start with a maximum duty cycle, causing a very high current through FET 7000. To prevent this, capacitor C2018 (at pin 11 of IC7001) ensures a soft start (voltage at pin 11 is low at start up, which gives a small duty cycle) and R3039 determines the maximum duty cycle.

Switch Off Peak Voltage

To protect the FET against high peak (drain-source) voltages at switch "off", a peak clamp circuit is added consisting of D6014, D6002, C2007, and R3010.
When the FET blocks, the diodes will lead the peak voltages away from the FET and will charge C2007.
When the FET conducts, this capacitor is discharged via R3010, the primary coil, and the FET itself.

Over Current and Fold Back

The current through the primary winding is measured by sense resistors R3012, R3013, and R3014. The resulting voltage is measured at pin 7 of IC7001. Once the voltage at this pin exceeds 1 V (so maximum current is set to 3 A), the duty cycle is regulated back.
If the output load keeps on increasing (I > 3 A), the system is unable to supply enough energy to maintain the output voltage in regulation. This is detected at pin 5 of IC7001 (via pin 8 of 5003, R3015, D6007 and R3037). Consequently, if this voltage drops below the fold back threshold voltage of 1 V, the IC will adapt the "current sense threshold". This will limit the current supply and by this, the output voltage. This will cause an avalanche effect, causing the supply to rapidly trim down.

Over Voltage

When the voltage on pin 6 of IC7001 will exceed 2.5 V, the control IC will stop oscillating (after 2 µs). The output voltages will drop, and the IC starts again. This can happen when the feedback loop is interrupted.

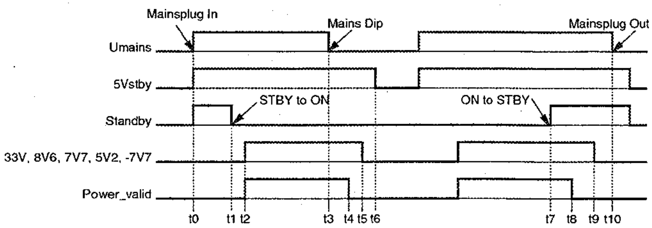
Demagnetisation

The internal demagnetisation block in IC7001 disables the output (pin 3) during the demagnetisation phase of transformer 5003. This is to prevent the FET from being switched "on". The info is taken from pin 8 of transformer 5003, and fed via R3015 and R3030 to pin 8 of IC7001. When the voltage on this pin drops below 65 mV, the demagnetisation phase is completed, and the FET can switch on.

Audio Plop

The POWER_VALID circuit is designed to detect the disappearance of the Mains voltage (at set switch "off" or at Mains voltage dips). This signal will then mute the audio outputs to prevent audio plops (see diagram AV8 position I7). The circuit compares the +5V2 output with the negative rectified 5V2 winding (which is in fact the transformed rectified Mains voltage). When this voltage disappears, transistor 7101 is activated and the POWER_VALID output will go "low" before the supply output voltages will drop. It will mute the audio outputs and stay "low" until the Mains voltage and the +5V2 output voltage returns.

Switch On/Off Behaviour



t0 = Mainsplug In.
t1 = From STANDBY to ON.
t3 = Mainsdip
t7 = From ON to STANDBY
t10= Mainsplug Out

CL16532098_002.eps
240901

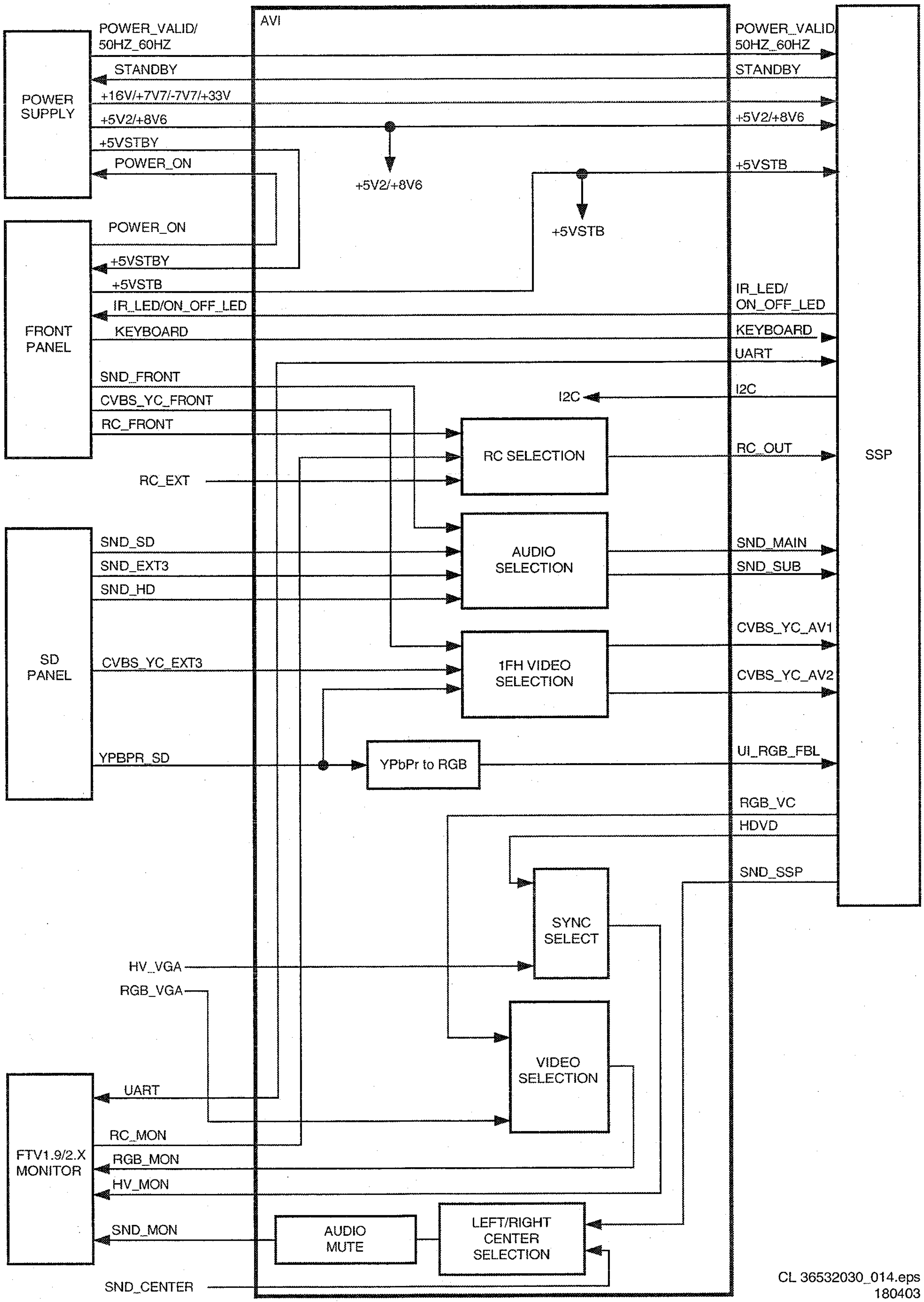
Figure 9-3 Timing diagram Power Supply

The start up of the PSU has to fulfil certain requirements.
At the moment the Mains voltage cord is connected (t0), the standby supply will generate the +5VSTBY (coming from the STANDBY pre-condition). With this voltage present, the microprocessor begins the start up procedure, by making the STANDBY command logic "low" (t1) and the POWER_ON command "high" (coming from the "off" pre-condition). After you press the power switch on the front panel, the "POWER_ON" signal will become "high" and within 2 seconds, the main supply will start, making the POWER_VALID signal "high" (t2).
When an Mains voltage dip occurs (t3), the POWER_VALID signal must go "low" before the output voltages will drop and must remain "low" until the Mains voltage returns.
When you put the set in standby, the microprocessor makes the STANDBY signal "high" (t7). The output voltages will drop, and the POWER_VALID signal goes "low", but the +5VSTDBY remains present.
Finally, this voltage will drop when the Mains voltage cord is disconnected (t10).

Typical timing values are:
- t1 - t2 = 0.1 < t < 1.2 s (dependent on the STANDBY PSU load).
- t3 - t4 = 20 < t < 350 ms (dependent on U_MAINS).
- t4 - t5 = 5 < t < 40 ms (dependent on the main PSU load).
- t5 - t6 = 10 < t < 1000 ms (dependent on U_MAINS and the STANDBY PSU load).
- t7 - t8 = 10 < t < 600 ms (dependent on U_MAINS and the MAIN PSU load).
- t8 - t9 = 5 < t < 40 ms (dependent on the MAIN PSU load).

9.3 Audio Video Interface Panel (AVI, diagram AV)

9.3.1 AVI: Introduction


AVI
POWER SUPPLY
FRONT PANEL
SD PANEL
FTV1.9/2.X MONITOR
SSP
POWER_VALID/ 50HZ_60HZ
STANDBY
+16V/+7V7/-7V7/+33V
+5V2/+8V6
+5VSTBY
POWER_ON
+5VSTB
IR_LED/ON_OFF_LED
KEYBOARD
UART
SND_FRONT
CVBS_YC_FRONT
RC_FRONT
RC_EXT
I2C
RC SELECTION
RC_OUT
AUDIO SELECTION
SND_SD
SND_EXT3
SND_HD
SND_MAIN
SND_SUB
1FH VIDEO SELECTION
CVBS_YC_EXT3
CVBS_YC_AV1
CVBS_YC_AV2
YPBPR_SD
YPbPr to RGB
UI_RGB_FBL
RGB_VC
HDVD
SND_SSP
SYNC SELECT
HV_VGA
RGB_VGA
VIDEO SELECTION
RC_MON
RGB_MON
HV_MON
SND_MON
AUDIO MUTE
LEFT/RIGHT CENTER SELECTION
SND_CENTER

CL 36532030_014.eps
180403

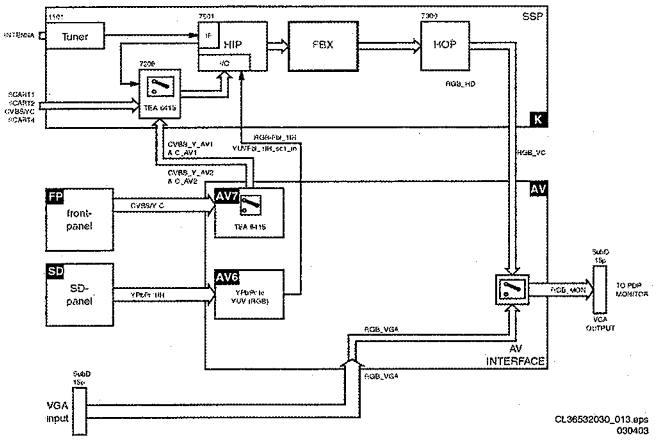
Figure 9-4 Block diagram AVI panel

The AVI contains a video switch, an audio switch, and an I/O expander with I2C control.
The AVI panel is an interface between the following panels/sources:

- Small Signal panel (SSP).
- Front panel (FP).
- VGA input.
- Standard Definition panel (SD).
- Power Supply panel (PS).

It also contains the outputs to the plasma monitor.

9.3.2 AVI: Video Processing


1101
ANTENNA
Tuner
7501
IF
HIP
I/O
FBX
7300
HOP
SSP
RGB_HD
7208
TEA 6415
SCART1
SCART2
CVBS/YC
SCART4
K
RGB-FB_1fH
YUV/FB_1fH_sc1_in
CVBS_Y_AV1
& C_AV1
CVBS_Y_AV2
& C_AV2
RGB_VC
AV
FP
front-panel
CVBS/Y C
AV7
TEA 6415
SD
SD-panel
YPbPr 1fH
AV6
YPbPr to
YUV (RGB)
SubD
15p
RGB_MON
TO PDP
MONITOR
VGA
OUTPUT
RGB_VGA
AV
INTERFACE
RGB_VGA
SubD
15p
VGA
input

CL36532030_013.eps
030403

Figure 9-5 Block diagram video processing

Video Source Selection (diagram AV7)

For the video source selection, a TEA6415 (item 7710) from SGS-Thomson is used. The main function of this IC is to switch eight video input sources to six outputs. Each output can be switched to only one of the inputs, but any same input may be connected to several outputs. All the switching possibilities are controlled through the I2C bus.

At the input of the IC, we find the following signals:

- CVBS or Y/C from FRONT.
- CVBS or Y/C from EXT3.
- CVBS or Y/C from the Scaler (not used in this chassis).

At the output of the IC we find:

- CVBS_Y_AV1 and C_AV1.
- CVBS_Y_AV2 and C_AV2.

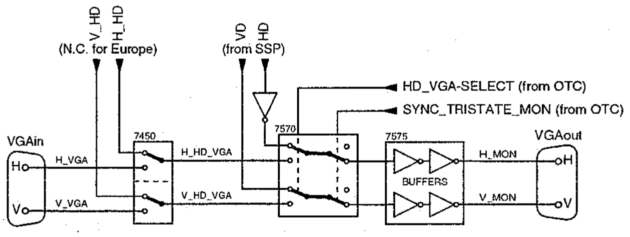
AV1 is connected to the CVBS/YC_FRONT input of the SSP (connector 0333).
AV2 is connected to the CVBS/YC_UI input of the SSP (connector 0372).
These signals go to the SSP via connectors 0333 and 0372, where they are fed to a second TEA6415 (item 7208), together with the video signals coming from the SCART connectors.

Video processing (diagram AV6)

The YPbPr signals coming from the SD panel (EXT5) are buffered, and then fed through a YPbPr-to-RGB matrix circuit (TSH93, item 7607). The matrix is made with discrete hardware and determined by resistor values.
The RGB_SD output signals are then fed to connector 0372 and routed, via an RGB selector, to the RGB2 (Universal Interface) input of the HIP IC (item 7501) on the SSP.

9.3.3 AVI: Sync Processing

General


V_HD
H_HD
(N.C. for Europe)
VD
HD
(from SSP)
HD_VGA-SELECT (from OTC)
SYNC_TRISTATE_MON (from OTC)
VGAin
H
V
H_VGA
V_VGA
7450
H_HD_VGA
V_HD_VGA
7570
7575
BUFFERS
H_MON
V_MON
VGAout
H
V

CL 16532023_055.eps
240901

Figure 9-6 Block diagram sync processing

The block diagram above shows the sync path. The AV Interface has the following sync inputs:

- Sync from VGA source (HV_VGA)
- Sync from SSP (HD_VD)

The selection between these inputs for the main picture is done with switch 7570. This switch is controlled via software with the HD_VGA_SELECT signal.

Note: If the Receiver box has to function without the monitor (e.g. in case of EPG data download), the H and V pulses may not be fed to the monitor. In this case, switch 7570 will be put open with the SYNC_TRISATE_MON control signal (SW controlled).

9.3.4 AVI: Audio Processing

General

The audio-part of the AV-interface consists of three separate parts:

- The source selection.
- The Centre-channel configuration.
- Muting (or anti-plop circuit).

Source Selection

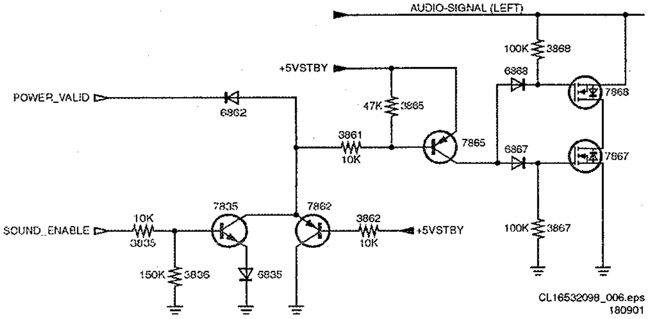
The source selection part redirects the five stereo inputs into two separate channels. These two channels (SNDL/R_MAIN_OUT and SNDL/R_SUB_OUT) are then connected to the SSP for further processing.
Note: The TEA6422 cannot handle the maximum level of 2.8 V of the SNDL/R_VGA signals. Therefore, these signals are attenuated by 3 dB (see R3801/3802 and R3806/3807 on diagram AV8). All other inputs are attenuated at the Front I/O panel or the HD connector panel. These attenuations are corrected again on the SSP.

Centre Channel Selection

The Centre input (cinch at the rear) is a separate audio input. This input bypasses all other inputs, and is designed to obtain a better *Home Cinema* configuration. In this case, the FTV monitor speakers will function as the centre channel. This input is selected via the CENTER_SELECT signal, which is controlled by the I/O Expander (items IC7880 and TS7853). It is selected by the user from the user menu.

Mute

To prevent audio plops and clicks (when the set is turned "on/off" or at channel switching), a mute circuit is implemented immediately after the centre channel selection part.


AUDIO-SIGNAL (LEFT)
100K 3868
6868
7868
+5VSTBY
POWER_VALID
6862
47K 3865
3861
10K
7865
6867
7867
7835
7862
SOUND_ENABLE
10K
3835
3862
10K
+5VSTBY
100K 3867
150K 3836
6835

CL16532098_006.eps
180901

Figure 9-7 Audio mute circuitry

The table below shows how this is done. It is controlled by the following signals:

- POWER_VALID line is a control signal generated by the power supply.
- SOUND_ENABLE line is a control signal coming from the microprocessor on the SSP.
- +5VSTBY line, from the Front panel.

Table 9-2 Truth table audio mute

POWER_VALID (from PSU)	SOUND_ENABLE (from uP on SSP)	+5VSTBY (from Front Panel)	SIGNAL MUTED
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

When the SOUND_ENABLE signal is high, the two N-channel FETs are conducting the audio signal to the GND, and will mute the audio output.
Why are two FETs implemented? Because in a case of "no mute", and FET 7868 directly connected to ground, the diode in this FET would distort the audio signal too much. With the addition of FET 7867, this distortion is eliminated, because this FET is connected in anti-series.
The supply for the inverter is connected to the +5VSTBY. This supply signal is always available when the Mains voltage is connected, so in case the Mains voltage is disconnected, the mute function is disabled.

9.4 Small Signal Panel (SSP, diagram K)

The SSP is based on the one used in the MG3.1 chassis. It consists of the following parts:

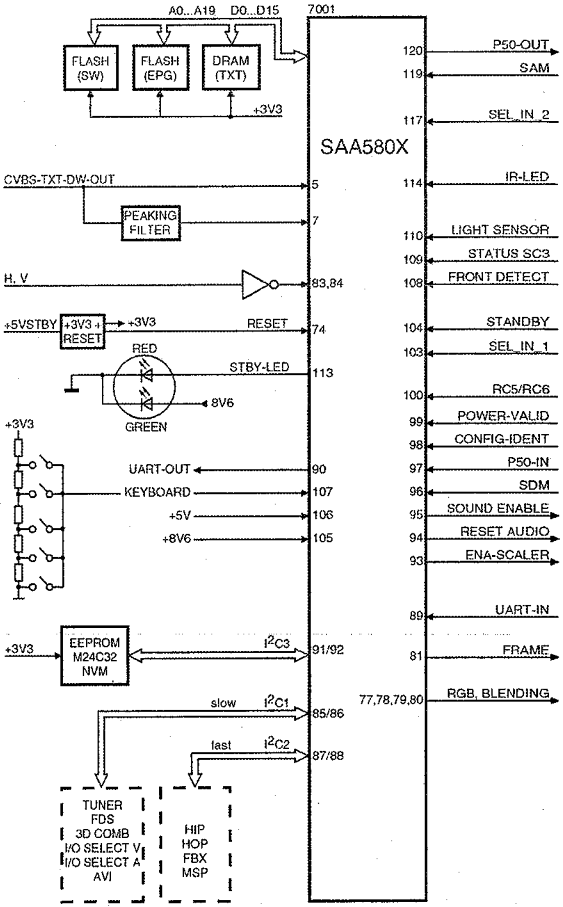
1. Control.
2. Video: Tuner and IF.
3. Video: HIP.
4. Video: Feature Box.
5. Video: HOP.
6. Audio

9.4.1 SSP: Control

The control part can be divided into:

- Set Control
- TXT/OSD
- Remote Control

Set Control


A0...A19
D0...D15
7001
FLASH (SW)
FLASH (EPG)
DRAM (TXT)
+3V3
SAA580X
120
P50-OUT
119
SAM
117
SEL_IN_2
CVBS-TXT-DW-OUT
5
114
IR-LED
PEAKING FILTER
7
110
LIGHT SENSOR
109
STATUS SC3
H, V
83,84
108
FRONT DETECT
+5VSTBY
+3V3 + RESET
+3V3
RESET
74
104
STANDBY
103
SEL_IN_1
RED
STBY-LED
113
8V6
GREEN
100
RC5/RC6
+3V3
99
POWER-VALID
98
CONFIG-IDENT
UART-OUT
90
97
P50-IN
KEYBOARD
107
96
SDM
+5V
106
95
SOUND ENABLE
+8V6
105
94
RESET AUDIO
93
ENA-SCALER
89
UART-IN
+3V3
EEPROM M24C32 NVM
I²C3
91/92
81
FRAME
slow
I²C1
85/86
77,78,79,80
RGB, BLENDING
fast
I²C2
87/88
TUNER
FDS
3D COMB
I/O SELECT V
I/O SELECT A
AVI
HIP
HOP
FBX
MSP

CL 36532021_005.eps
180303

Figure 9-8 Block diagram Control part (µP)

The SAA5801 (IC7003) is called the OTC (**O**SD, **T**XT, and **C**ontrol). In this IC, the microprocessor and the TXT-decoder (or Closed Caption for the USA) are integrated. The SAA5801 is also called the OTC2.5 because also TXT-level 2.5 is supported.

At start up, the RESET signal is generated with TS7006/7007. During a reset, all I/O pins are high. When a RESET is generated, the set is in Standby mode.
The 8V6 and the 5V2 are sensed by pins 105 and 106. If one of them is not present, the Power supply is switched "off". The OTC will generate an error code to indicate what was wrong. The horizontal (HOSD-PIP) and vertical (VD) pulses are also fed to the OTC for stable OSD and CC. To create good stable pulses, these signals are inverted and fed to the OTC. The RGB-outputs (77/78/79) together with fading (pin 80) are fed to the HOP. This fading pin has a double function:

- Make the menu transparent.
- Fast-blanking for CC.

There are three I2C busses used (see section "I2C overview"):

1. Slow I2C bus (max. 100 kHz) for tuner, DW, video-, and audio selection.
2. Fast I2C bus (max. 400 kHz) for the HIP, MSP, HOP, and FBX (PICNIC, FALCONIC, and EAGLE).
3. NVM I2C bus for the Non Volatile Memory to avoid data corruption.

The OTC also has a connection with the Front panel:

- Driving the "on" and "STANDBY" LEDs. **Service tip:** The green LED gives a quick indication that the 8V6 voltage is present.
- This chassis has an IR send-LED connected to pin 90 for communication with DST or ComPair.
- The remote control signal comes in on pin 100.

Memory
The set software is in a 4 MB ROM (IC7002) and in a 32 kB ROM inside the OTC. The level at pin 73 of the OTC determines whether this internal software is used at start up. This level is determined with R3026/3029. The external ROM is driven via the OE and CS signals.

The Non Volatile Memory (NVM) IC7008 is a 32 kB version M24C32W6, and is used to store

- Software identification.
- Operational hours.
- Error codes.
- Option codes.
- Presets.
- Alignments.

All ICs in this part are supplied with 3V3. For this, a 3V3 stabilizer is used (IC7009).

Monitor communication (UART/FSP)

In total, four versions of the Receiver box are realised. There is an US and EU version (main difference is the HD part for US). Furthermore, there will be a version for the current 42" FTV1.9 monitor and a version for the new FM2x monitor range. The difference between these versions is mainly the communication between the Receiver box and monitor. See table below:

Table 9-3 Overview UART diversity

Conn. 0303	F21R with FTV1.9	F21R with FM2x
Pin 4	Not used	RXDO
Pin 11	CONFIG_IDENT	TXDO
Pin 12	TXDO	Not used
Pin 15	RXDO	Not used

The Receiver box has to support both the FTV1.9 and the FM2x plasma monitors. The communication protocol for the FTV1.9 monitor is based on UART with a CONFIG_IDENT signal. However, all FM2x monitors have a new improved protocol called FSP (FTV System Protocol). Therefore, the pin layout on the FTV monitor output connector has been changed.

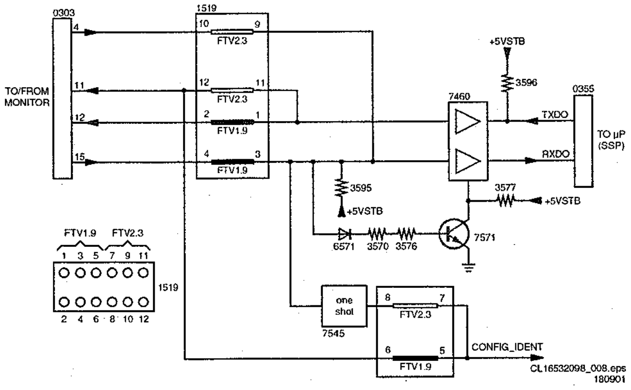

0303
TO/FROM MONITOR
4
11
12
15
1519
10
9
FTV2.3
12
11
FTV2.3
2
1
FTV1.9
4
3
FTV1.9
+5VSTB
3596
7460
0355
TXDO
RXDO
TO µP (SSP)
3595
+5VSTB
3577
+5VSTB
6571
3570
3576
7571
FTV1.9
FTV2.3
1 3 5 7 9 11
2 4 6 8 10 12
1519
one shot
7545
8
7
FTV2.3
6
5
FTV1.9
CONFIG_IDENT
CL16532098_008.eps
180901

Figure 9-9 Block Diagram UART Circuitry

As the FM2x has no CONFIG_IDENT signal to "wake up" the Receiver box, a "dummy" CONFIG_IDENT is derived from the RXDO signal with the aid of a "one-shot generator" (item 7545).

In order to prevent the RXD-line from connecting to ground, a protection circuit is added. This circuit puts the RXD-buffer into tri-state if the input is connected to ground for more than 100 ms.
Because the diversity is realized with jumpers (connector 1519), there are no differences in panel stuffing for both versions.

Teletext/On Screen Display (TXT/OSD)

The TXT/OSD-decoder in the OTC gets its video signal directly on pin 5. The RGB-outputs are available on pins 77/78/79. Fast blanking is realized by pin 80. The RAM (IC7001) of the microprocessor is also used for the decoder.

Remote Control

The remote control uses RC6, because commands like "cursor control in eight directions" are used.

For this chassis, there are three possible RC input sources:

- RC_MON (coming from monitor),
- RC_BOX (coming from box), and
- RC_EXT (coming from an external source; this is not used).

The selection is performed as shown in the figure below:

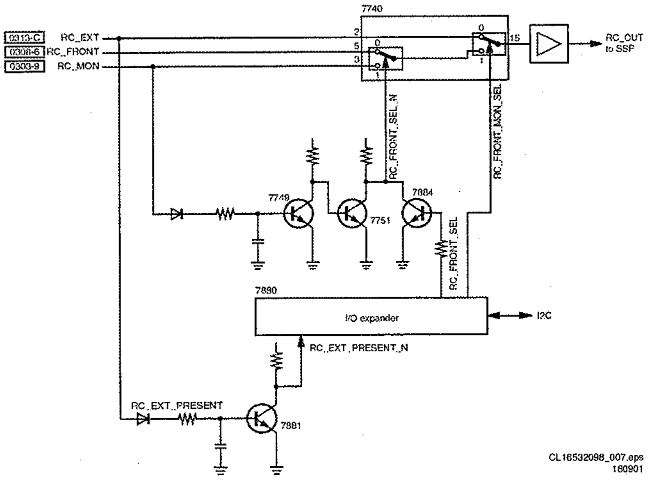

7740
0313-C
RC_EXT
0308-6
RC_FRONT
0303-9
RC_MON
2
5
3
0
1
0
1
15
RC_OUT to SSP
RC_FRONT_SEL_N
RC_FRONT_MON_SEL
7749
7751
7884
RC_FRONT_SEL
7880
I/O expander
I2C
RC_EXT_PRESENT_N
RC_EXT_PRESENT
7881
CL16532098_007.eps
180901

Figure 9-10 Block Diagram RC Selection Circuitry

When CONFIG_IDENT (for FTV1.9) or AYT (for FM2x) is detected, the RC_MON is selected.
If there is no monitor connected, the RC_FRONT_SELECT signal is always "low", so RC _MON cannot be selected (via TS7749 and TS7751). After start up, when the I/O-expander is not yet set via I2C, the RC_FRONT signal is connected to RC_OUT.

9.4.2 SSP: Tuner and IF

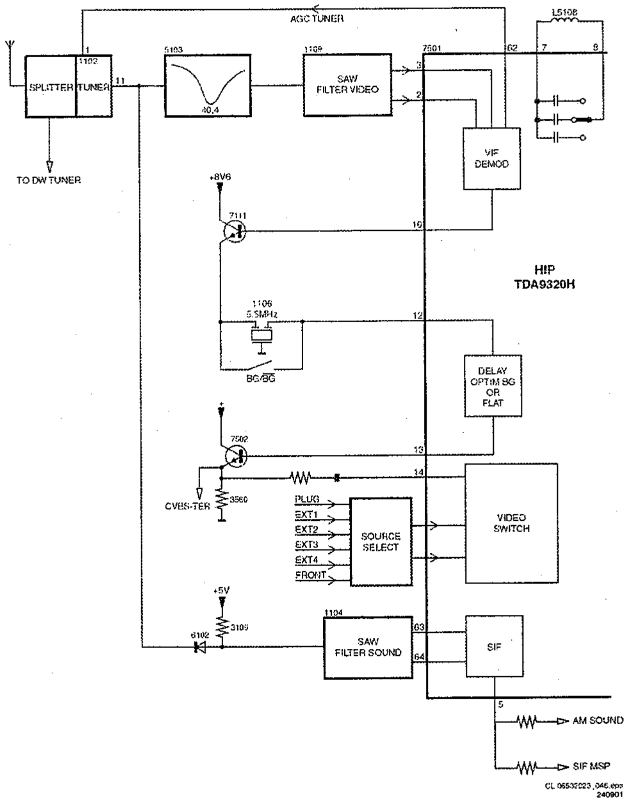


Figure 9-11 Overview Tuner and IF Part

For Double Window, a splitter is used. This splitter is on the chassis beside the main tuner. From this splitter, the aerial signal is fed to the two tuners (UV1316/A): the main tuner on the SSP and the DW tuner on the DW panel. Therefore, the aerial input is on the splitter.

The tuner part contains a tuner and an oscillator-mixer. The tuner is I2C controlled. The reference voltage at pin 9 is 33 V. This voltage (V_TUN) is derived from the secondary side of the standby supply. The OTC, together with the HIP, controls the tuning procedure.
The frequency of the local oscillator is compared with the frequency of a reference oscillator by a PLL. The varicap voltage is changed via I2C, and that changes the frequency of the reference oscillator.
For the higher frequencies, the tuning speed is increased by increasing the current that changes the varicap voltage.

The IF-part can be split into two important parts:
1. The IF-filter.
2. The IF-amplifier and demodulator.

The IF signal is fed to a SAW filter (item 1109 for the video and 1104 for the audio). The output of this filter is fed to the HIP for demodulation. The demodulator is PLL-controlled via a VCO. This VCO is I2C controlled (Service Alignment Mode IF-AFC alignment). Tuning of the VCO is possible by switching some small capacitors parallel to L5108. These capacitors are integrated in the HIP.
Also, the AGC takeover point is I2C controlled (with the SAM menu).

Service tip: If the AFC is **not** adjusted **correctly**, very strange faults can occur: like spontaneous standby switching, cracking sound, incorrect CC, etc.

The demodulated video signal is available at pin 10, and then fed to a sound-trap. This is for filtering the rest sound carrier. Then the group delay time (system dependent) can be adapted, and at pin 13 of the HIP, the CBVS is available for further processing in the set.

The tuner-IF signal is also fed to a second SAW filter for the sound. At pin 5 of the HIP, the IF-sound is available. This signal is fed to the MSP for further processing (the IF-sound is demodulated by the MSP3410).

9.4.3 SSP: HIP (High-end Input Processor, diagram K1)

Introduction
The HIP (IC7501, TDA9320H) has the next functions:
- Source selection.
- Video IF-demodulation.
- Luminance, chrominance, and sync processing.

Inputs
The set has a total of five external inputs (AV1 - 5).

The HIP has an integrated source selector, which can handle:
- 3 CVBS inputs.
- 2 Y/C inputs.
- 2 RGB inputs.

The HIP detects whether the input is Y/C or CVBS and decides what to do. There are two inputs (pins 39 and 40) for detection of the RGB status. The other status voltages are checked by the OTC.

Video Processing
- The video identification block monitors whether a video signal is detected at one of the inputs. The Y/C switch detects whether the input is CVBS or Y/C and switches these signals for luminance and chrominance processing. If a comb filter is used, the HIP detects there can be "combed", and the YC switch will select the signals for the comb filter. The comb filter can be switched to the right system via the two system lines (SYS1 and SYS2) from the HIP.
- If the input signal is CVBS, then an internal colour trap is used in the Y path.
- The Y-delay can be controlled via the service menu to match the colour to the luminance (because of different signal paths there are different timings)
- Via the RGB-matrix, external RGB-signals are converted to YUV, for further 2fH conversion.
- The internal YUV switch switches between the demodulated video signal and an external RGB source.
- The sync processor in the HIP provides H_A and V_A sync signals for the Feature Box. This sync part is alignment free, but it should be noted that the line oscillator is locked with the colour oscillator.

Note: If the quartz crystal is defective, there will be no colour and synchronization problems. This crystal is very precise: if it is replaced by another type, there may be no colour, because of a different capacity. Therefore, you must use the genuine replacement part.

Outputs
The HIP has the following outputs:
- YUV (50 Hz), for further picture processing on pins 49, 50, and 51.
- CVBS-DW, video signal for the Double Window module on pin 32.
- CVBS-SC2-OUT, monitor output (WYSIWYR = What You See Is What You Record).
- CVBS-TXT-OUT, CVBS for TXT and Comb filter.
- CVBS-TER, video signal from the tuner is fed to the I/O switching and to EXT1 on pin 19 of SCART.

.4.4 SSP: Feature Box (FBX, diagram L)

The objective for this module is to reach a sharper picture by means of a higher definition. This is achieved via the "Pixel Plus" feature. Below you will find an explanation of Pixel Plus.

Introduction

The basic function of the Feature Box (FBX) is picture improvement, and depending on the version, several scan conversion methods are possible. The PICNIC (SAA4978H) is the central key component.

In the Feature Box 7 (FBX7), a new IC is used, called the "Eagle" (item 7724, T8F24EF). This IC performs the following picture improvements:

- **Horizontal:** increases pixels per line from 840 to 1680 (the number of pixels per line is doubled). This, by itself, does not mean an improvement in definition. To achieve that, the new pixels are digitally processed inside the Eagle with Luminance Transient Improvement (LTI) and Peaking. This will give the new pixels extra picture information, which results in steeper slopes and contrast improvement in details.
- **Vertical:** increases from 525p lines to 1050i lines. Also, those new lines are processed inside the Eagle with LTI and Peaking, again resulting in lines with extra picture information.
- The **line frequency** is fixed on 2fH and the **frame frequency** at 60 Hz. In addition, other modes, like "Digital Scan" are still possible.
- The Eagle performs the colour enhancement features of the TOPIC.

Block diagram

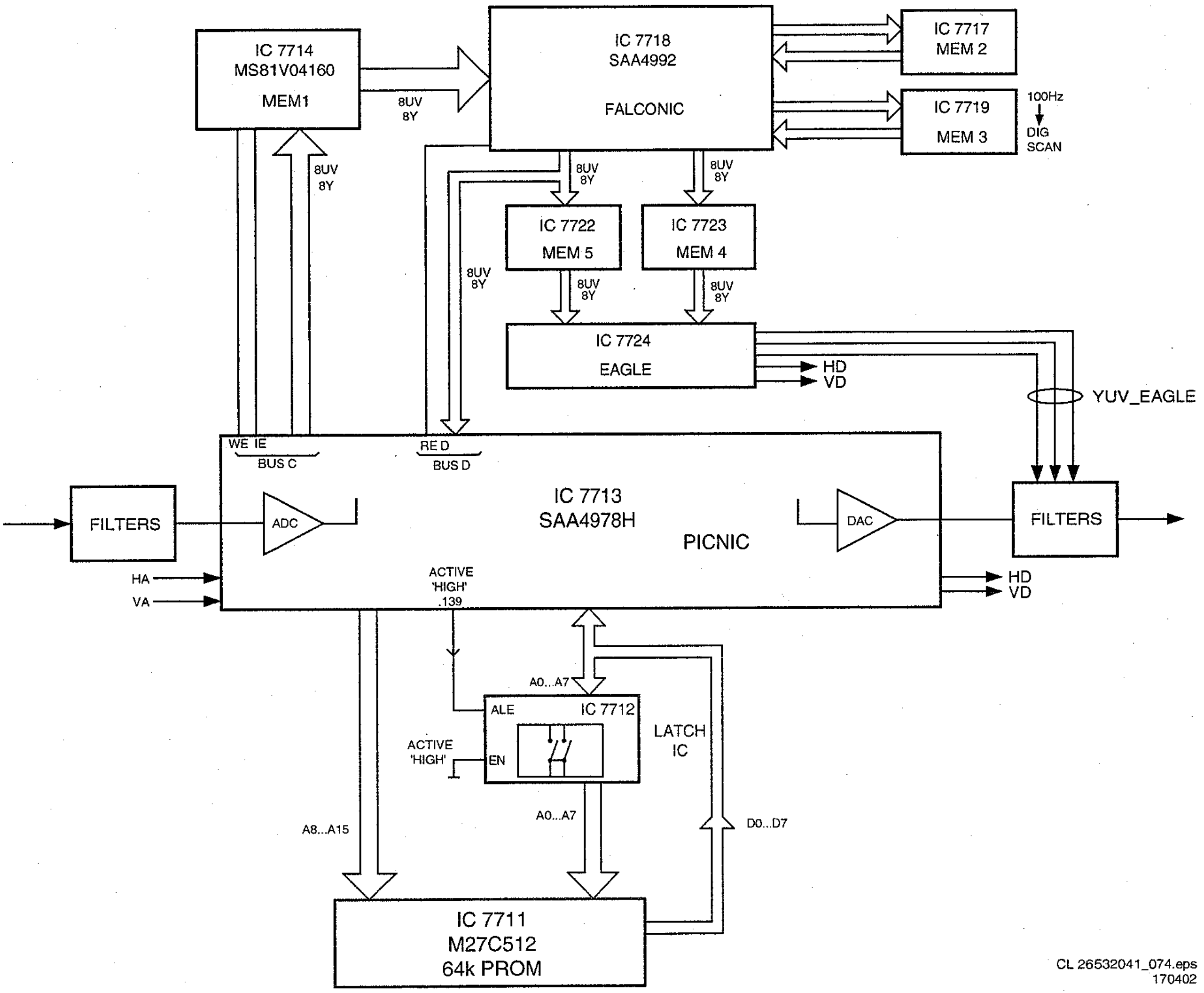

IC 7714
MS81V04160
MEM1
8UV
8Y
IC 7718
SAA4992
FALCONIC
IC 7717
MEM 2
IC 7719
MEM 3
100Hz
DIG
SCAN
8UV
8Y
8UV
8Y
8UV
8Y
8UV
8Y
IC 7722
MEM 5
IC 7723
MEM 4
8UV
8Y
8UV
8Y
IC 7724
EAGLE
HD
VD
YUV_EAGLE
WE IE
BUS C
RE D
BUS D
FILTERS
ADC
IC 7713
SAA4978H
PICNIC
DAC
FILTERS
HA
VA
ACTIVE
'HIGH'
.139
HD
VD
A0...A7
ALE
IC 7712
LATCH
IC
ACTIVE
'HIGH'
EN
A8...A15
A0...A7
D0...D7
IC 7711
M27C512
64k PROM
CL 26532041_074.eps
170402

Figure 9-12 Block Diagram FBX7

The 50 Hz YUV signals, coming from the HIP, are fed to the PICNIC via an anti-aliasing filter.
The (AABB) "frame frequency doubling" is done by the PICNIC (SAA4978, 160 pins QFP) together with a field memory (MEM1). The PICNIC can handle most 100 Hz functions (except Progressive Scan).
Via bus "C", a digitalized signal is presented to MEM1 (Field Memory 1), which is used for the 60 to 120 Hz conversions. The signal goes further via the data-bus to the FALCONIC. This IC has the following functions:

- Line flicker reduction.
- Digital Noise Reduction (DNR).
- Progressive scan.

It has an internal CPU and a (small) integrated ROM. The actual FBX7 software is located in an external ROM (item 7711). In order to limit the number of connections between the PICNIC and the external ROM, a number of lines are used twice. The lines A8 to A15 are fixed lines, while the lines A0 to A7 are made switchable with the eight data lines of the ROM. This is done via a Latch (item 7712), which is controlled by pin 139 of the PICNIC (the ALE signal).

At the end, the digital YUV signals enter, via MEM4 and MEM5, the Eagle IC.

This IC has the following functions:

- Luminance Transient Improvement (LTI).
- Peaking.
- Programmable number of lines.
- Programmable number of pixels per line.
- Demo mode (split screen).
- Improved colour transients (CTI) and colour enhancement (TOPIC).
- Improved vertical zoom.

The digital YUV-signals from the Eagle go, via a passive output filter, to the HOP.

PICNIC (Diagram L1)

The PICNIC has the following functions:

- ADC/DAC.
- Interlaced to progressive scan conversion.
- Dual screen compression
- The Panorama mode.
- Automatic Aspect Ratio Adaptation (AARA)
- Colour Transient Improvement (CTI)
- The contrast improvement (Dynamic Contrast).

All these functions are integrated in one IC: the SAA4978H, 160 pins QFP.

ADC/DAC

- Analogue to Digital conversion is done with three identical 9-bit ADCs.
- Digital to Analogue conversion uses three identical 10-bit DACs.

In the PICNIC, there are three nine-bit ADCs present for Y, U, and V. For digitising the Y (luminance), nine bits are used (to realize a more detailed picture). These nine bits are only internally used. Via dithering, the nine bits are reduced to eight bits and this data is stored into memory. The data in the memory is fed back to the PICNIC and via un-dithering the data is again reproduced to nine bits for processing.
U/V (colour difference signals) is also sampled with nine bits. These two nine bit data streams are multiplexed to four bit data streams. As the perception of colours by the human eye is less sensitive to luminance, this reduction is allowed.

Interlaced to progressive scan conversion

The main function of the PICNIC is the "Analogue to Digital" conversion, spatial noise reduction, histogram functions (like Dynamic Contrast and Black Stretch) for YUV, and HV-sync processing. Also, the line frequency is doubles.
De-interlacing itself is realized in the FALCONIC (Field And Line CONverter IC).

Further features of the PICNIC:

- **Dual Screen Compression.** The PICNIC can provide horizontal video compression up to 50 %. The compress mode can be used to display dual screens.
- **The Panorama Mode.** To fit 4:3 pictures into a 16:9 display, it is possible to apply a panoramic horizontal distortion, to make a screen-fitting picture without black sidebars or lost video. The centre horizontal gain is programmable and the side gain is automatically adapted to make a screen-fit.
- **Automatic Aspect Ratio Adaptation (AARA).** This feature uses data from the "black bar detection circuit" to adapt the vertical and horizontal amplitude to an aspect ratio belonging to the display, without the black bars.
- **Dynamic Contrast.** To make the contrast (black/white) range wider, Philips has invented Dynamic Contrast. It uses the digital memory used in 120 Hz sets. It measures every A-field (30 x per second), and digitally analyses where on the greyscale most of the image is located. If it is a relatively dark image, the lighter part of that image is stretched towards white, so that more contrast will become visible in that picture. If it is a relatively light image, the darker part of that image is stretched towards black, so that these darker parts will have more contrast. When the image is in the middle of the greyscale, both dark and light parts are stretched.

FALCONIC (Diagram L3)

Besides "Natural Motion", The FALCONIC (Field And Line CONverter IC) has the following functions:

- Line flicker reduction (Digital Scan).
- Noise reduction (DNR, Digital Noise Reduction).
- Movie phase detection.
- Progressive scan.
- Variable vertical sample rate conversion.
- Synchronous No parity Eight bit Reception and Transmission interface (SNERT).

422 processing

The FALCONIC can do "422" processing. This means eight data lines for Y and eight data lines for U/V (844 = 422). Therefore, the bandwidth for the colour difference increases: the bandwidth for Y remains 6 MHz, and the bandwidth for colour difference is now 3 MHz. This means that the picture for DVD is much better. For this extra bandwidth, an extra field memory is used: IC7640.

Improved motion detection (Natural Motion)

This set utilizes AB'A'B scanning, a new sample for natural motion.
The FALCONIC has an extra advantage for motion detection: the maximum number of pixels that can be followed in AB'A'B scanning is higher: This produces a more natural motion, even with very fast movements.

Improved line flicker reduction (Digital Scan)

The FALCONIC offers motion compensated line flicker reduction. This virtually leads to complete elimination of line flicker.

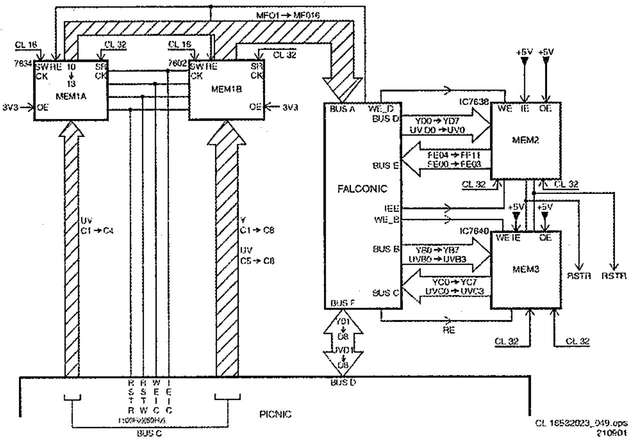


Figure 9-13 Block Diagram Digital Scan

Bus A is the input bus for the FALCONIC. The data comes from the two memory ICs (IC7602 and 7634) and the FALCONIC will cluster this data. It is possible to connect two field memories to the FALCONIC. The output of the FALCONIC is fed back to the PICNIC via bus D.

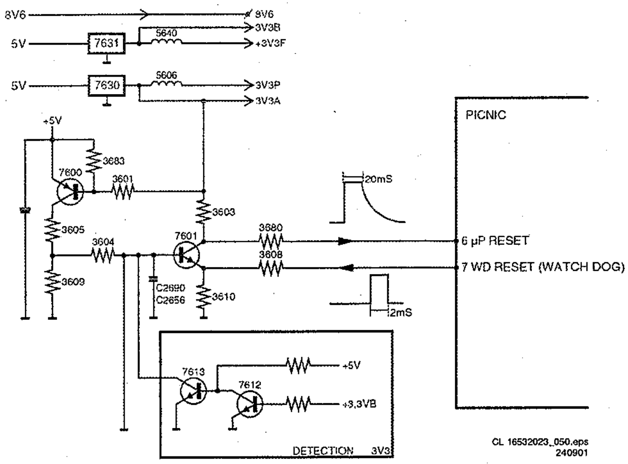
The FALCONIC has two possible configurations:

- **Economy mode:** In this mode, only Field Memory 2 is mounted (saving the cost of Field Memory 3). In this configuration, the full frame store can be made by a factor 2 data compression, using 2 dimensional DPCM techniques. This results in a performance with more quantisation noise, while maintaining improved MEMC quality. In this case, a full "422" processing cannot be achieved. Only the 422-DPCM is possible.
- **Full functionality mode:** This configuration uses Field Memory 2 and 3. Therefore, no picture performance

concessions are made here. In this mode, all FALCONIC features can be applied optimally. However, to be able to perform full "422" processing, the FM1 must be extended with an extra 4 bits, for a total of 16 bits.

Power Supply and RESET Circuit

Besides the two incoming voltages, 8V6 and 5V2, two stabilizers (for power consumption reasons) are used for the 3V3 (3V3A and 3V3B).



CL 16532023_050.eps
240901

Figure 9-14 Block Diagram Reset Circuitry

Via the reset circuit (TS7600/TS7601) a pulse of 20 ms is generated for the µP (in the PICNIC) and for the ROM. After power "on", the 3V3 is built up, which is derived from the 5V2. As long as the 5V2 is below the 3V3, the 3V3 follows the 5V2. TS7600 blocks and so does TS7601. The voltage on pin 6 of IC7611 increases in the same way as the 3V3.
If the 5V2 rises above 3V3, the 3V3 stabilizes and TS7600 starts to conduct. Capacitors C2656//C2690 are charged by R3604 and R3605. At a voltage of 0.6 V, TS7601 will conduct and the voltage at pin 6 of IC7611 becomes low again. The (P is reset now.
If the PICNIC cannot communicate with the ROM, a reset is generated by the watchdog. Pin 7 of the PICNIC generates a pulse to create a new reset pulse for pin 6.

If one of the two supply voltages (3V3A, 3V3B) is absent, a safety problem could occur. The 3V3A is the supply voltage for the PICNIC and the 3V3B for the FALCONIC. If the 3V3 is too low, the base of TS7601 will be low via TS7612 and TS7613. If the base of TS7601 is made low, a RESET signal is generated for the PICNIC.

Eagle (Diagram L2)

Introduction

Some strong picture improvements are carried out inside the Eagle, which all contribute to the excellent picture quality. These improvements are:

- LTI (both horizontal and vertical).
- CTI (only horizontal).
- Peaking (both horizontal and vertical).
- More pixels per line.
- More lines per frame.
- Better colour representation for skin tones, green, and sky.

By means of over sampling, the video signals get a sample frequency of 64 MHz, a bandwidth of 20 MHz, and 1680 pixels per line (previously 32 MHz, 10 MHz and 840 pixels/line). This requires two extra field memories (MEM4 and MEM5).

The Eagle can handle four different modes:

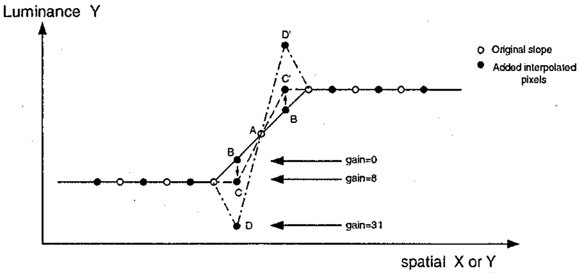
- Digital Natural Motion (PAL): 100 Hz, 2fH, 2:1 Interlace (2048 pixels x 625 lines)
- Pixel Plus (PAL): 75 Hz, 2fH, 2:1 Interlace (2048 pixels x 833 lines)
- Double Lines (PAL): 50 Hz, 2fH, 2:1 Interlace (2048 pixels x 1250 lines)
- Pixel Plus (NTSC): 60 Hz, 2fH, 2:1 Interlace (2048 pixels x 1050 lines)

LTI (Luminance Transient Improvement)

The main objective of LTI is a steeper slope at contrast transitions (for example, from 10 mV to 900 mV within 3 pixels i.s.o. 5 pixels for one detail). It is based on waveform altering around a signal jump.

Important: The LTI, as used in the Eagle, is designed for interpolated picture contents. This means that for pixel/line doubling, one of the two pixels/lines is an interpolated value. When a picture jump is interpolated, you will get extra room to make it steeper (you get extra pixels to describe the slope). Without interpolation, you cannot use this kind of LTI.

- LTI can add "ears" to the waveform at the jump (a kind of controlled overshoot).
- LTI "estimates" the frequency of the jump and will adapt the amplification to this frequency.
- LTI is applied both horizontally and vertically.
- LTI is amplitude dependent. This means that only "big" jumps are processed. It works with a threshold, which is coupled to the noise meter via the Auto TV software.
- LTI is also frequency dependent. This means that it is distributed over the slopes. When there are many steep slopes in the signal, LTI will only process the steepest ones. If there are only a few slopes, LTI will process all of them. This is fully hardware implemented.



CL 16532149_083.eps
061201

Figure 9-15 Horizontal LTI

For horizontal LTI, the number of pixels is doubled (64 MHz) by means of interpolation. Pixel A at the transition will keep its luminance value, while the (new) pixels B can have a luminance value of zero to max. For example:

- Pixels B can keep the same value (gain = 0)
- Pixels B can get the value of C and C' (gain = 8), which will give a steeper slope.
- Pixels B can also get the value of D and D' (gain = 31), which will give an even steeper slope with the "ears". These "ears" will give a **contrast** improvement.

For CTI, the same principle is used, in order to get better **colour** transitions.

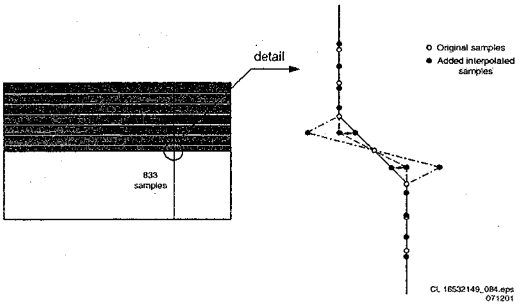

detail
833 samples
○ Original samples
● Added interpolated samples
CL 16532149_084.eps 071201

Figure 9-16 Vertical LTI

The principle for vertical LTI is the same as for horizontal LTI. The shift from 525 to 1050 lines is done by means of a scaler. With these extra-interpolated samples, it is possible to create steeper slopes, possibly with "ears".

Peaking/Coring

The objective of "peaking" is contrast improvement (for example, from 50 mV_pp to 70 mV_pp for one detail).
It uses a noise threshold (coring = non-linear filtering around zero-level), thus it works everywhere in the picture (except below the threshold level).
The added difference signal is frequency dependent, which results in frequency dependent contrast improvement. When the difference signal becomes too large, the peaking is reduced (smartness).

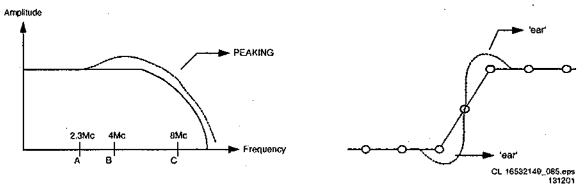


Figure 9-17 Peaking

To obtain the filter characteristic shown above, filters are set at three parameters (see A, B, and C above). This way, only the higher frequencies are "lifted". After sending the luminance signal through these filters, the filter output is added to the original signal. In this way, the "ears" are created, together with the steeper slopes. These "ears" will give a **contrast** improvement at details.

Both horizontal and vertical peaking is **amplitude dependent**: the higher the signal jump, the lower the peaking. This is done to avoid high jumps getting big "ears", because this will introduce uneven contouring. To avoid peaking on noise levels, coring is used. The coring threshold is set via the Auto TV software, by means of the noise meter.
Therefore, the result is that **the peaking processes only details.**

The horizontal peaking is also **frequency dependent**: it is possible to perform peaking around three frequencies (when combined, it is even possible to peak at variable frequencies). In Auto TV, this feature is software coupled to the sharpness meter, in order to get the most optimal filter characteristic. The vertical peaking works on a fixed frequency.

Output

The YUV signals presented to the HOP come from the Eagle. These three signals all have the same circuitry so it is only explained once (for Y).

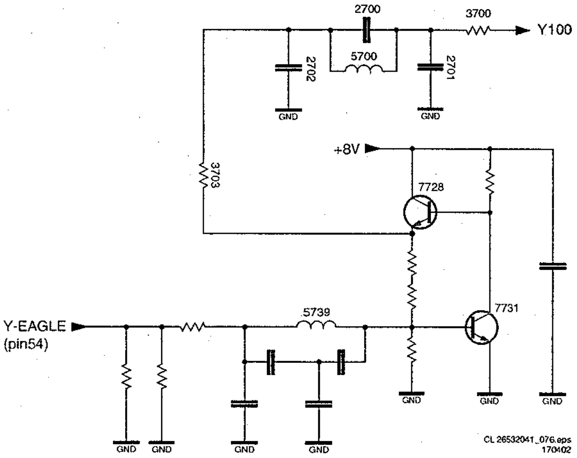

2700
3700
Y100
2702
5700
2701
GND
GND
+8V
3703
7728
5739
7731
Y-EAGLE
(pin54)
GND
GND
GND
GND
GND
GND
GND
GND
CL 26532041_076.eps 170402

Figure 9-18 YUV Output Filter

The YUV signals are first filtered by a 64 MHz passive filter (L5739 with Cs). Because the output signals from the Eagle are too small to drive the HOP directly, the circuit around TS7731 and TS7728 amplifies them. The gain is determined by R3791, R3788, and R3807. For the Y-signal the gain is 2, for the U-signal it is 1.33, and for the V-signal it is 1.05.

9.4.5 SSP: HOP (High end Output Processor, diagram K6)

Introduction

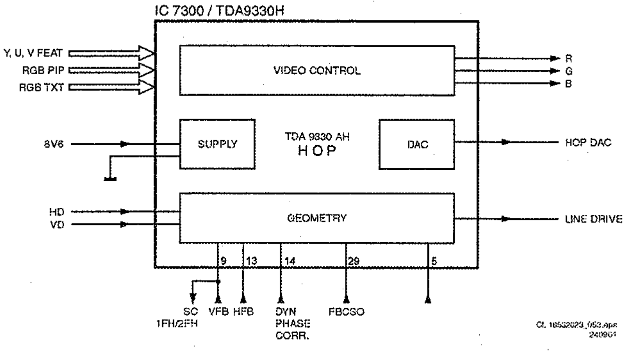

IC 7300 / TDA9330H
Y, U, V FEAT
RGB PIP
RGB TXT
VIDEO CONTROL
R
G
B
8V6
SUPPLY
TDA 9330 AH
H O P
DAC
HOP DAC
HD
VD
GEOMETRY
LINE DRIVE
9
13
14
29
5
SC 1FH/2FH
VFB
HFB
DYN PHASE CORR.
FBCSO

Figure 9-19 Block diagram HOP

The video processor and digital deflection processor are integrated in the HOP (IC7300, TDA9330H). Its main functions are:

- RGB interface for PIP/DW.
- Second RGB interface for OSD/CC.
- Control of saturation, contrast, and brightness.
- Black/blue stretch.

Operation

The RGB and fast blanking signals from PIP/DW are fed to pins 30 - 33. The RGB is converted to YUV in the HOP, so there can be switching between PIP and the main picture. After input selection, the YUV input is converted to RGB outputs. The RGB and fast blanking from the OTC (OSD and CC) are inserted on pins 35 - 38.
Blue stretch measures the amplitude of the three RGB signals. If one of these colour signals reaches more than 80% of the nominal value, the amplification of Red and Green decreases. This is to achieve a higher colour temperature.
The RGB outputs are available at pins 40 - 42. They are buffered and fed to connector 0340, which goes to the AV-interface.

HFB protection

The LINEDRIVE output signal of the HOP (pin 8) is directed to the AV interface (via connector 0315-1), where an HFB generator circuit produces the HFB pulses. This signal is redirected (via 0315-3) to the HOP (pin 13).
If the HFB is not present, this is detected. The microprocessor puts the TV into protection and reads a register in the HOP. This will generate error code 71.

.4.6 SSP: Audio processing

Introduction

The sound processing is distributed between the Flat Monitor (amplifier) and the Receiver Box (processing). The sound processing in the Receiver Box is completely done by the:
MSP 3410D: demodulation for Europe and AP (including NICAM), or
MSP 3440G: demodulation for US/LatAm/Taiwan (this IC also covers Korean stereo).
The MSP ICs contain audio processing, used for the basic L/R stereo sound. This processing involves bass, treble (via the equalizer), and balance (trim speakers). The volume is set to a fixed value, because the volume control is done in the monitor (via UART).
With the user interface, audio selection can be "mono", "stereo", or "surround" mode (surround mode will give spatial functionality). Stereo and spatial is only possible if a stereo signal is available.

In case of Dual Screen, the headphone sound is processed by the TDA7309 (item 7620) on the Double Window panel. This IC also takes up volume, bass, and treble settings. The output is delivered to headphone via a separate amplifier NJM4556 (item 7757).

All the extra audio sources, compared with the SSP, can be used in the main **and** the DW channel. The "Centre" input is available on the AV-interface panel. With this input, it is possible to use the monitor left and right speakers as a centre speaker in a home cinema configuration. This input can be selected via the User Interface.
For VGA it is not possible to select the "Centre" input, because the E-box OSD is not working for VGA inputs.

In case of Dual Screen, a separate audio demodulator IC (TDA9820) handles the demodulation of the signal that is supplied by the second Tuner. This IC and the tuner are situated on a separated board called the Double Window panel (DW panel).
The Dual Screen mode can only produce BTSC mono sound for the DW tuner. Analogue 2CS, BTSC-stereo, SAP, or NICAM stereo are **not** implemented at the DW-panel.

The selection of the possible inputs is divided over two separate panels: the SSP and the AVI panel. The input configuration dependents on the E-box version (in combination with a TEA6422 (item 7777), the MSP is also used for a part of the source selection in the E-box).

Table 9-4 Audio I/O overview

Audio inputs and outputs (EU/AP)	Location
RF input	SSP
EXT1= SCART1 L/R-in and L/R-out	SSP
EXT2= SCART2 L/R-in and L/R-out	SSP
EXT3= SCART3 L/R-in	SSP
EXT4= SCART4 L/R-in	SSP
SD L/R (YPbPr-1fH)	SD panel
VGA L/R-in	AVI panel
Center audio in	AVI panel
Front L/R-in	Front panel
VGA audio out for FTV monitor L/R-out	AVI panel
CL-out for a Dolby audio receiver	SSP
Headphone out L/R	Front panel

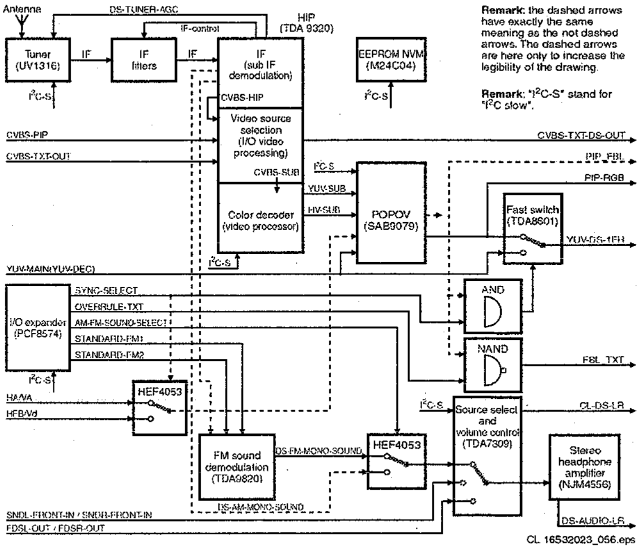
9.5 Double Window Panel (DW, diagram M)

9.5.1 DW: Introduction

The Double Window panel is the same as the one used in the MG3.1.
For sets with Double Window, a splitter is used. This splitter is on the LSP besides the main tuner. From this splitter, the aerial signal is fed to the two tuners: the main tuner (SSP) and the DW tuner (DW module).
Therefore, the aerial input is on the splitter; the main tuner and the double window tuner have a phono socket.

9.5.2 DW: Operation

Block Diagram


Antenne
DS-TUNER-AGC
IF-control
HIP
(TDA 9320)
Tuner
(UV1316)
IF
IF
filters
IF
IF
(sub IF
demodulation)
EEPROM NVM
(M24C04)
I^2C-S
I^2C-S
CVBS-HIP
Video source
selection
(I/O video
processing)
CVBS-PIP
CVBS-TXT-OUT
CVBS-TXT-DS-OUT
CVBS-SUB
I^2C-S
PIP_FBL
PIP-RGB
YUV-SUB
HV-SUB
Color decoder
(video processor)
POPOV
(SAB9079)
Fast switch
(TDA8601)
YUV-DS-1FH
I^2C-S
YUV-MAIN(YUV-DEC)
SYNC-SELECT
OVERRULE-TXT
AM-FM-SOUND-SELECT
STANDARD-FM1
STANDARD-FM2
I/O expander
(PCF8574)
AND
NAND
FBL_TXT
I^2C-S
HA/VA
HFB/Vd
HEF4053
I^2C-S
Source select
and
volume control
(TDA7309)
CL-DS-LR
FM sound
demodulation
(TDA9820)
DS-FM-MONO-SOUND
HEF4053
Stereo
headphone
amplifier
(NJM4556)
DS-AM-MONO-SOUND
SNDL-FRONT-IN / SNDR-FRONT-IN
FDSL-OUT / FDSR-OUT
DS-AUDIO-LR

Remark: the dashed arrows have exactly the same meaning as the not dashed arrows. The dashed arrows are here only to increase the legibility of the drawing.

Remark: "I^2C-S" stand for "I^2C slow".

CL 16532023_056.eps
210901

Figure 9-20 Block Diagram DW Panel

The DW module is controlled by the I2C slow bus. The module contains audio demodulation, source selection, volume control, and a headphone amplifier. All CVBS selections are done in the HIP.

The DW module is based on the POPOV picture-in-picture chip (SAB9079). This chip has two YUV inputs and combines these in one output. The YUV input to the module is called the YUV-MAIN signal, while the YUV input from the colour decoder is the YUV-SUB signal.
The POPOV is a multi-standard processor, processing NTSC, PAL, and SECAM line-field frequencies and contains a fully

programmable conversion-space-conversion unit, making it possible to convert YUV to RGB.
The POPOV needs a 4 Mbit DRAM. The output is configured as RGB for 2fH output and YUV for 1fH output.

The DW module can be divided into 3 sections:

- Video path
- Synchronization and control
- Audio path

Video Path

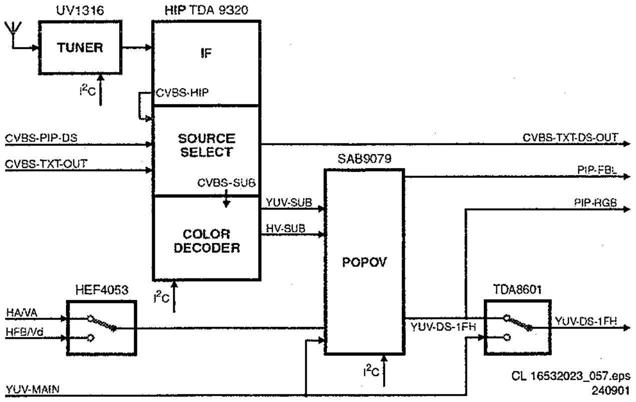

UV1316
HIP TDA 9320
TUNER
IF
I²C
CVBS-HIP
CVBS-PIP-DS
CVBS-TXT-OUT
SOURCE SELECT
CVBS-SUB
COLOR DECODER
YUV-SUB
HV-SUB
SAB9079
POPOV
CVBS-TXT-DS-OUT
PIP-FBL
PIP-RGB
HEF4053
I²C
HA/VA
HFB/Vd
YUV-MAIN
I²C
TDA8601
YUV-DS-1FH
YUV-DS-1FH
CL 16532023_057.eps
240901

Figure 9-21 Video path DW panel

HIP (High end Input Processor, diagram M1)
The HIP on the DW module (called SUB-HIP) almost completely corresponds to the TUNER-HIP section, which is located on the SSP, except:

- The address is different (pin 48 is connected to ground here).
- There is no Comb filter.
- Only CVBS signals (no RGB) are sent to SUB-HIP.

The HIP on the DW module (SUB-HIP) can be divided into 3 sections.

- IF.
- Source select.
- Colour decoder + sync.

The tuner sends an MF signal to the IF section of the HIP. The CVBS (CVBS-HIP), which comes from the IF, is passed on to the source select section, together with the CVBS-PIP signal and the CVBS-TXT-OUT signal (main picture SSP). Here a choice is made, and the CVBS-SUB is sent to the chroma demodulator. The outputs are YUV-SUB.

PIP Controller (Picture In Picture, diagram M4)

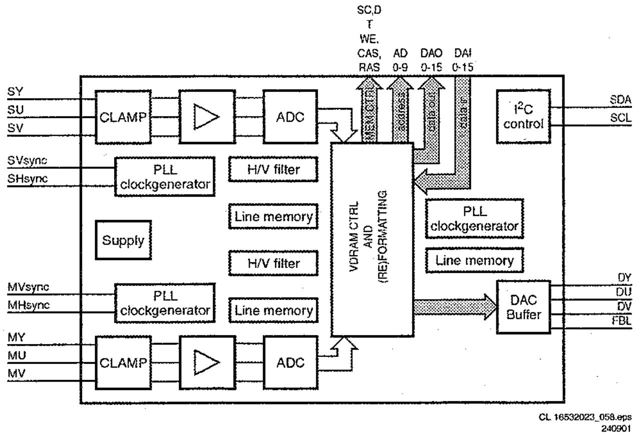

SC,D
T
WE,
CAS,
RAS
AD 0-9
DAO 0-15
DAI 0-15
SY
SU
SV
CLAMP
ADC
MEM CTRL
address
data out
data in
I²C control
SDA
SCL
SVsync
SHsync
PLL clockgenerator
H/V filter
Line memory
Supply
H/V filter
VDRAM CTRL AND (RE)FORMATTING
PLL clockgenerator
Line memory
MVsync
MHsync
PLL clockgenerator
Line memory
DAC Buffer
DY
DU
DV
FBL
MY
MU
MV
CLAMP
ADC
CL 16532023_058.eps
240901

Figure 9-22 Internal Block Diagram POPOV

The POPOV IC (SAB9079) is a "picture-in-picture" controller, which can process two analogue CVBS signals to one picture. The slave address is 2C. The POPOV has two 8-bit ADCs and one 8-bit DAC.
The supply voltages are 3V3 and 5V2.
The inputs are: YUV/H/V-SUB, YUV/HA/VA-MAIN, or HFB/VD.
The outputs are: YUV-DS-1fH or PIP-RGB and PIP-FBL.

The oscillation frequency of the PLL is 56 MHz (F_OSC). Various system frequencies are derived from this frequency (for example, 28 MHz, 14 MHz, and 7 MHz). A sample rate of 14 MHz is used for the ADC.
The IC is controlled by the I2C-slow bus. The POPOV is supplied with 3V3 and 5V2.

In our application, the choice between 1fH and 2fH is determined by the software:

- **PIP:** In the case of a PIP selection, the sub picture is processed by the POPOV and set at its output as RGB (2fH). The signal is locked by the sync pulses, which originate from the feature box (thus 2fH). The PIP-RGB signal then goes to the HOP where it is inserted into the main picture.
- **Double Window:** In the DW, the main picture and the sub picture are processed to a double window picture by the POPOV and set at its output as YUV (1fH). The signal is locked by the sync pulses that come from the main HIP (thus 1fH). The YUV-DS-SUB signal is then passed to the input of the feature box, where it is processed further.
- **Multi-PIP and Photo finish:** For multi-PIP and photo finish, the path is the same as with double window (thus 1fH).

A replay function is also possible; however, this function is not in use at the present time.
Reduced pictures are continuously stored in the memory, re-read, and displayed in PIP-format at the right moment. The memory is used for replay, photo finish, PIP and DW.
The number of the pictures stored depends on the size of the memory and on the size of the picture to be displayed.

The Field Memory

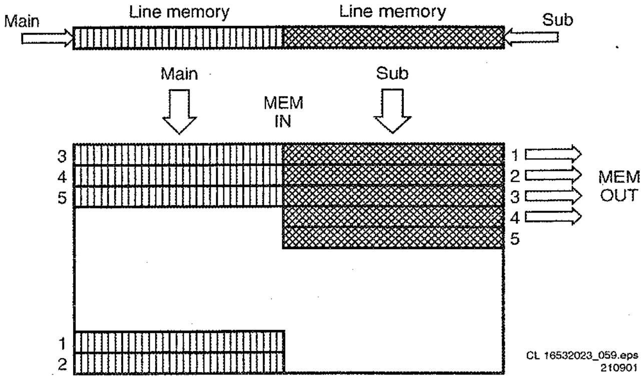

Main
Line memory
Line memory
Sub
Main
MEM IN
Sub
3
4
5
1
2
3
4
5
MEM OUT
1
2
CL 16532023_059.eps
210901

Figure 9-23 Internal Memory Layout

The main picture and the sub picture, which are passed to the POPOV, are not synchronized. In the POPOV, each channel has a line memory. When the line memory is full, this line is stored in the memory (RAM) at the right position. This happens on both channels.

The location where it is stored in the field memory (the external RAM) depends on the total number of lines. The readout then occurs line by line from the field memory. In this way, the pictures can be placed close to each other. The readout frequency must of course be twice as high as the read-in frequency (the information of two line times must be read in one line time).

Structure of memory: 16 data bits in, 16 data bits out, nine address bits.

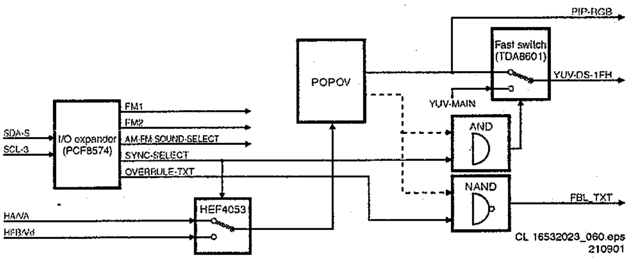
Size of the memory:

- 29 row address * 29 column address.
- 512 * 512 = 262144 memory positions.
- each memory position uses 16 bits; so 4194304 bits = 4 Mbit = 0.5 MBytes.

FBL-DS-OUT is present at pin 19 of the POPOV; the "high" level here is 5V2. The maximum FBL value however, which is passed on to the HOP pin 5 on the SSP, is 3V3. Thus, we must apply a voltage division here with R3753 and R3754. The components 6752, 3755, and 2798 are necessary in order to keep the transconductance high enough. The PIP-FBL signal is 1V4 (high level). This low value has been chosen for the sake of transconductance.

The Non Volatile Memory
The NVM is a 4 kB version. Here the AGC, AFC, RGB coefficients, and the YUV pedestals are stored.
RGB coefficients: In the POPOV there is a matrix, which converts YUV to RGB. Certain coefficients, which are necessary for a good implementation, are used. The POPOV determines which coefficients are used.
YUV pedestals: These pedestals bring the clamping levels of the main signal and the sub signal to the same level.

Synchronization and Control



CL 16532023_060.eps
210901

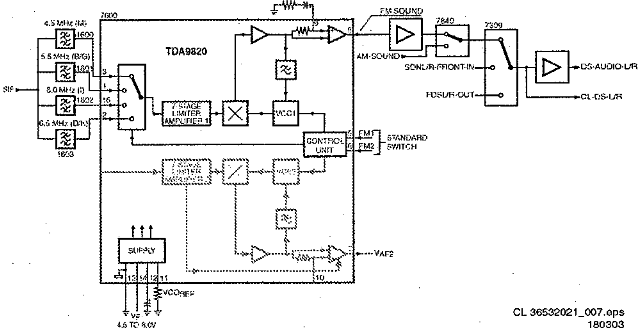
Figure 9-24 Sync/control part of DW panel

A HEF4053, which is switched by a PCF8574, will determine/ control at which sync-pulses the POPOV must be locked: 1fH or 2fH. In the sound section, the system (BG, M, I, DK) and the choice between AM and FM is determined for the same PCF8574.

Normally CC has priority over the PIP. With the OVERRULE-TXT signal, this can be avoided. As the PIP-FBL signal is "high" and the OVERRULE-TXT line of the I/O expander is "high", the output of the NAND is low. Thus, the PIP has priority over CC.

When the POPOV sets YUV or RGB at its output, the PIP_FBL signal will be "high". The switch (TDA8601), which must choose between the signal from the POPOV and the signal from the SSP (YUV-MAIN), may only be in "high" state in double window mode (i.e. both inputs of the AND port must be high).

Sound Path (diagram M5)



CL 36532021_007.eps
180303

Figure 9-25 Audio path of DW panel

All sources can be used as audio signal source for the headphone output signal with the DW application active. The DW tuner can only be used as source for the headphone. The DW tuner signal is used as mono source for the headphone.

The sound section is located close to the FM demodulator (TDA9820). The sound-IF of the HIP is led to the TDA9820, where it is demodulated. Then the LF signal goes to the outside via some switching ICs.
The TDA9820 is a multi standard TV FM demodulator. It has two channels, but in our application, only one channel is used. The IC is supplied with 5V2 at pin 14.
The IC has two separate FM demodulators, which make use of internal PLL switching: one demodulator with four inputs and one demodulator with one input. In our application, we only use the first demodulator (the one with 4 inputs). At the input of this demodulator, we find one switch with four inputs and one output. Thus, a choice can be made from four systems.
The signal, which first passes a bandpass filter, is transferred to pin 1, 2, 3, or 16 and extended to a limiter amplifier. Then it is supplied to the demodulator. Pin 8 of the IC is the output.
The control signals FM1 and FM2 of the PCF8574TS (7860) are supplied to pin 5 and 6. These signals determine which system must be used. It can choose between M, BG, DK, and I (fixed on M for USA). The control unit provides the switching of the input signal and the de-tuning of the PLL. A table that shows the various possibilities is below:

Table 9-5 Audio Control Signal Overview

Standard	FM1	FM2	Freq. (MHz)	Input
B/G	1	1	5.5	1
M	1	0	4.5	3
I	0	1	6.0	16
D/K	0	0	6.5	2

The demodulated signal, which originates from pin 8, is then supplied to the switch IC (pin 12 and 13 of IC7840) via R3605 and C2605 (for de-emphasis) and via TS7621 and TS7622 (see diagram M5). The switch IC switches between the optional AM sound, which comes from the SUB-HIP, and the FM demodulated signal. This HEF is also controlled by IC7860 (PCF8574TS).
The output (pin 14) is then supplied to TDA7309. This IC is a stereo audio processor. It provides source select, volume, bass, and treble control. It can also potentially control loudness and mute. The IC is supplied with 8V6 at pin 16. The TDA7309 has three stereo inputs:

- FDSL-OUT (pin 17) and FDSR-OUT (pin 14); these signals originate from the SSP and from the sound of the CVBS-PIP-DS, which is passed on to the sub-HIP.
- AM/FM at pins 13 and 18; sound of the sub tuner (mono).
- SNDL-FRONT-IN (pin 20) and SNDR-FRONT-IN (pin 11). This is the sound, which comes from the front inputs.

The IC is controlled by pin 4 and 5. The address is determined by pin 8 (ground in this case).

There are two stereo outputs:

- CL_DS_L (pin 1) and CL_DS_R (pin 10). These are constant level signals, thus no regulation is necessary. This signal is supplied to the MCS module.
- DS-AUDIO-L (pin 2) and DS-AUDIO-R (pin 9). This signal is sent to the headphone plug 0344 via output amp switching (gain = 1.5).

9.6 Front Panel (FP, diagram FP)

9.6.1 General

This panel serves as an interface with the "outside world", and has the following inputs/controls/indicators:

- Power switch.

- Power LED.
- Audio L/R in.
- Video CVBS in.
- Video SVHS in.
- Headphone out.
- IR send-LED and receiver-LED (for Service).
- IR receiver (for Remote Control).
- Control buttons for MENU, PROGRAM, and VOLUME.

9.6.2 Audio path

Front audio inputs (SNDL/R_FRONT) are connected to the TEA6422 (item 7810) on the AV-Interface.
The headphone output signal (DS_AUDIO_L/R) from the DW module is routed to the front panel.

9.7 High Definition Panel (HD, diagram HD)

9.7.1 General

The only function of this panel is to supply cinch connectors for the 2fH YPbPr and audio L/R inputs.

9.7.2 Audio path

On the HD-panel, there are three audio inputs:
- AV3 (CVBS or Y/C).
- AV4 (YPbPr-1fH).
- HD (YPbPr-2fH).

The AV3 input signals (SNDL/R_EXT3), AV4 input signals (SNDL/R_SD), and HD input signals (SNDL/R_HD) are all routed to the TEA6422 on the AVI panel.

9.8 Auto TV

The Auto Picture Control (or AutoTV) aims at giving the customer the best possible picture performance at any time. Therefore, it does a real time processing of the video signal and, as a result, it decides to adapt several video parameters throughout the whole chassis. The user can choose the total effect of the Auto Picture Control on the screen via the remote control.

AutoTV consists of a set of algorithms that perform the following tasks:
- Auto Noise Reduction:
  - Input: noise measurement done in PICNIC.
  - Output: noise reduction of PICNIC, coring of PICNIC, TOPIC (if present), or EAGLE.
- Auto Sharpness:
  - Input: steepness information and band energy in PICNIC.
  - Output: sharpness settings in PICNIC, TOPIC (if present), or EAGLE module.
- Auto Ambient Light (in combination with histogram):
  - Input: light sensor information (from TV monitor).
  - Output: is depending on the user setting of Active Control. If "maximum", saturation and contrast of the HOP and histogram settings in PICNIC. If "medium", only HOP saturation and PICNIC histogram.
- Auto colour:
  - Input: user smart mode choice.
  - Output: colour features of the EAGLE or TOPIC, like green enhancement and skin tone correction.

The FTV E-Box has no own light sensor, instead they is featured in the TV monitors. The E-box is involved in the image control loop for these light sensors. The 42" F19D and 50" FM25 monitor do **not** have a light sensor.

The user can select four different settings: OFF, MINIMUM, MEDIUM, and MAXIMUM. The setting does not change the amount of the influence of the algorithms on the screen, but partly switches algorithms ON (see table below).

Table 9-6 Active Control settings

Active Control	OFF	MIN	MED	MAX	ON (**)
Auto Ambient	off	off	on (*)	on	off
Auto Color	(***)	(***)	(***)	(***)	(***)
Auto Histogram	on	on	on	on	on
Auto Sharpness	on	on	on	on	on
Auto Noise	off	on	on	on	on

(*) In MEDIUM, the monitor contrast coupling of ambient is not working.
(**) When the light sensor is not present, ambient light control is not possible and the setting of the AutoTV button is limited to OFF/ON.
(***) Independent of Active Control is OFF/MIN/MED/MAX. Dependent of colour enhancement setting (in picture menu) and smart picture mode.

9.9 Abbreviation list

ADC	Analogue to Digital Converter
AM	Amplitude Modulation
AP	Asia Pacific
ATSC	Advance Television Systems Committee
AV	External Audio/Video
AVI	Audio and Video Interface
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used in LATAM and AP-NTSC countries
PWB	Circuit Board Assembly (Printed Circuit Board)
ComPair	Computer aided rePair
CSYNC	Composite SYNC
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFU	Directions For Use: owner's manual
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DTS	Digital Theatre Sound
DVD	Digital Video Disc
DW	Double Window
E-box	Electronic box (Receiver box)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EU	EUrope
EXT	EXTernal (source); entering the set by SCART or cinch (jack)
FALCONIC	Field And Line CONverter IC
FBX	Feature BoX
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FSP	FTV System Protocol
FTV	Flat TV (plasma screen)
HD	High Definition
HFB	Horizontal FlyBack
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I2C	Integrated IC bus

I2S	Integrated IC Sound bus
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
IR	Infra Red
IRQ	Interrupt ReQuest
LATAM	LATin AMerica
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	LoudSpeaker
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, used mainly in Europe.
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory: IC containing TV related data (for example, options)
OC	Open Circuit
OSD	On Screen Display
P50	Project 50 or Easy Link
PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PICNIC	Picture Improvement Combined Network IC
PIP	Picture In Picture
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
RAM	Random Access Memory
RC	Remote Control transmitter
RC5	Remote Control system 5, the signal from the remote control receiver
RGB	Red, Green, and Blue
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
ROM	Read Only Memory
RXD	Receive Data (UART)
SCART	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs
SCAVIO	Scaler Control Audio Video Input and Output
SCL	Serial CLock I2C
SD	Standard Definition
SDA	Serial DAta I2C
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Memoire. Colour system used mainly in France and Eastern Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SMPS	Switch Mode Power Supply
SND	SouND
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SSP	Small Signal Panel
STBY	STandBY
SVHS	Super Video Home System
SW	SoftWare
THD	Total Harmonic Distortion
TOPIC	The most Outstanding Picture improvement IC
TXD	Transmit Data (UART)
TXT	TeleteXT
UART	Universal Asynchronous Receiver Transmitter
uP	MicroProcessor
VCR	Video Cassette Recorder
VGA	Video Graphics Array
YPbPr	Component video (Y= Luminance, Pb/Pr= Colour difference signals)
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video
0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format
480i	480 visible lines, interlaced
480p	480 visible lines, progressive scan
1080i	1080 visible lines, interlaced
1080p	1080 visible lines, progressive scan

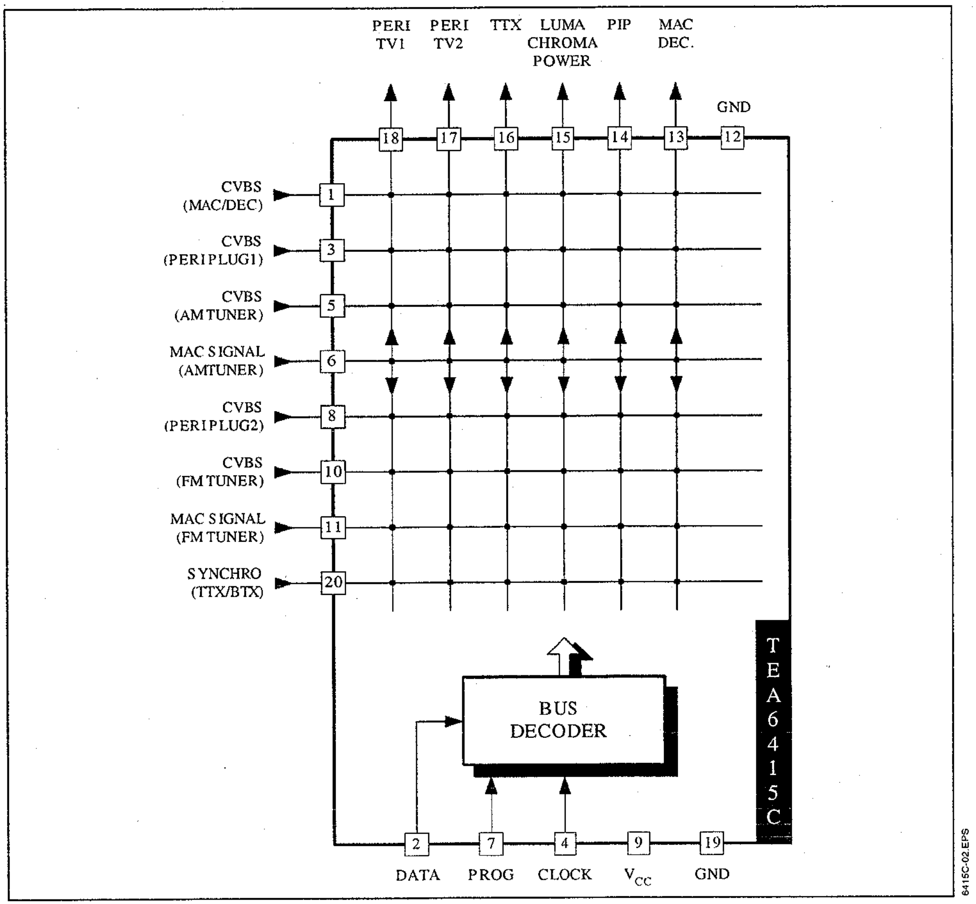
9.10 IC Data Sheets

In this section, the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of the "memory" and "logic" ICs) are given.

9.10.1 Diagrams AV7 / K8, TEA6415 (IC7710 / IC7208)

TEA6415C

BLOCK DIAGRAM


PERI TV1
PERI TV2
TTX
LUMA CHROMA POWER
PIP
MAC DEC.
GND
18
17
16
15
14
13
12
CVBS (MAC/DEC)
1
CVBS (PERIPLUG1)
3
CVBS (AM TUNER)
5
MAC SIGNAL (AMTUNER)
6
CVBS (PERIPLUG2)
8
CVBS (FM TUNER)
10
MAC SIGNAL (FM TUNER)
11
SYNCHRO (TTX/BTX)
20
BUS DECODER
TEA6415C
2
7
4
9
19
DATA
PROG
CLOCK
V$_{CC}$
GND
6415C-02.EPS

GENERAL DESCRIPTION

The main function of the IC is to switch 8 video input sources on 6 outputs.

Each output can be switched on only one of each input. On each input an alignment of the lowest level of the signal is made (bottom of synch. top for CVBS or black level for RGB signals).

Each nominal gain between any input and output is 6.5dB. For D2MAC or Chroma signal the alignment is switched off by forcing, with an external resistor bridge, 5 V_{DC} on the input. Each input can be used as a normal input or as a MAC or Chroma input (with external resistor bridge). All the switching possibilities are changed through the BUS.

Driving 75Ω load needs an external transistor.

It is possible to have the same input connected to several outputs.

The starting configuration upon power on (power supply : 0 to 10V) is undetermined.

In this case, 6 words of 16 bits are necessary to determine one configuration. In other case, 1 word of 16 bits is necessary to determine one configuration.

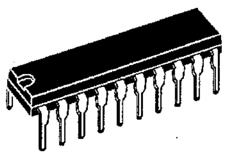
Figure 9-26 TEA6415 Internal Block Diagram (Switch)

SGS-THOMSON
MICROELECTRONICS

TEA6415C

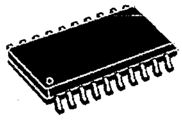
BUS-CONTROLLED VIDEO MATRIX SWITCH

- 20MHz BANDWIDTH
- CASCADABLE WITH ANOTHER TEA6415C (INTERNAL ADDRESS CAN BE CHANGED BY PIN 7 VOLTAGE)
- 8 INPUTS (CVBS, RGB, MAC, CHROMA, ...)
- 6 OUTPUTS
- POSSIBILITY OF MAC OR CHROMA SIGNAL FOR EACH INPUT BY SWITCHING-OFF THE CLAMP WITH AN EXTERNAL RESISTOR BRIDGE
- BUS CONTROLLED
- 6.5dB GAIN BETWEEN ANY INPUT AND OUTPUT
- -55dB CROSSTALK AT 5MHz
- FULLY ESD PROTECTED



DIP20
(Plastic Package)

ORDER CODE : TEA6415C



SO20
(Plastic Micropackage)

ORDER CODE : TEA6415CD

DESCRIPTION

The main function of the TEA6415C is to switch 8 video input sources on the 6 outputs.

Each output can be switched to only one of the inputs whereas but any same input may be connected to several outputs.

All the switching possibilities are controlled through the I^{2}C bus.

PIN CONNECTIONS

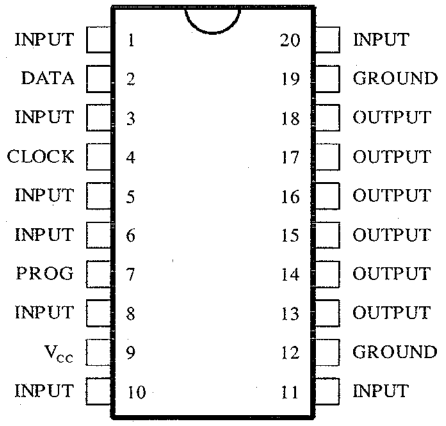

INPUT 1
DATA 2
INPUT 3
CLOCK 4
INPUT 5
INPUT 6
PROG 7
INPUT 8
V_{CC} 9
INPUT 10
20 INPUT
19 GROUND
18 OUTPUT
17 OUTPUT
16 OUTPUT
15 OUTPUT
14 OUTPUT
13 OUTPUT
12 GROUND
11 INPUT
6415C-01.EPS

Figure 9-27 TEA6415 Pin Layout TEA6415 (Switch)

9.10.2 Diagram C0, TDA8315T (IC7724)

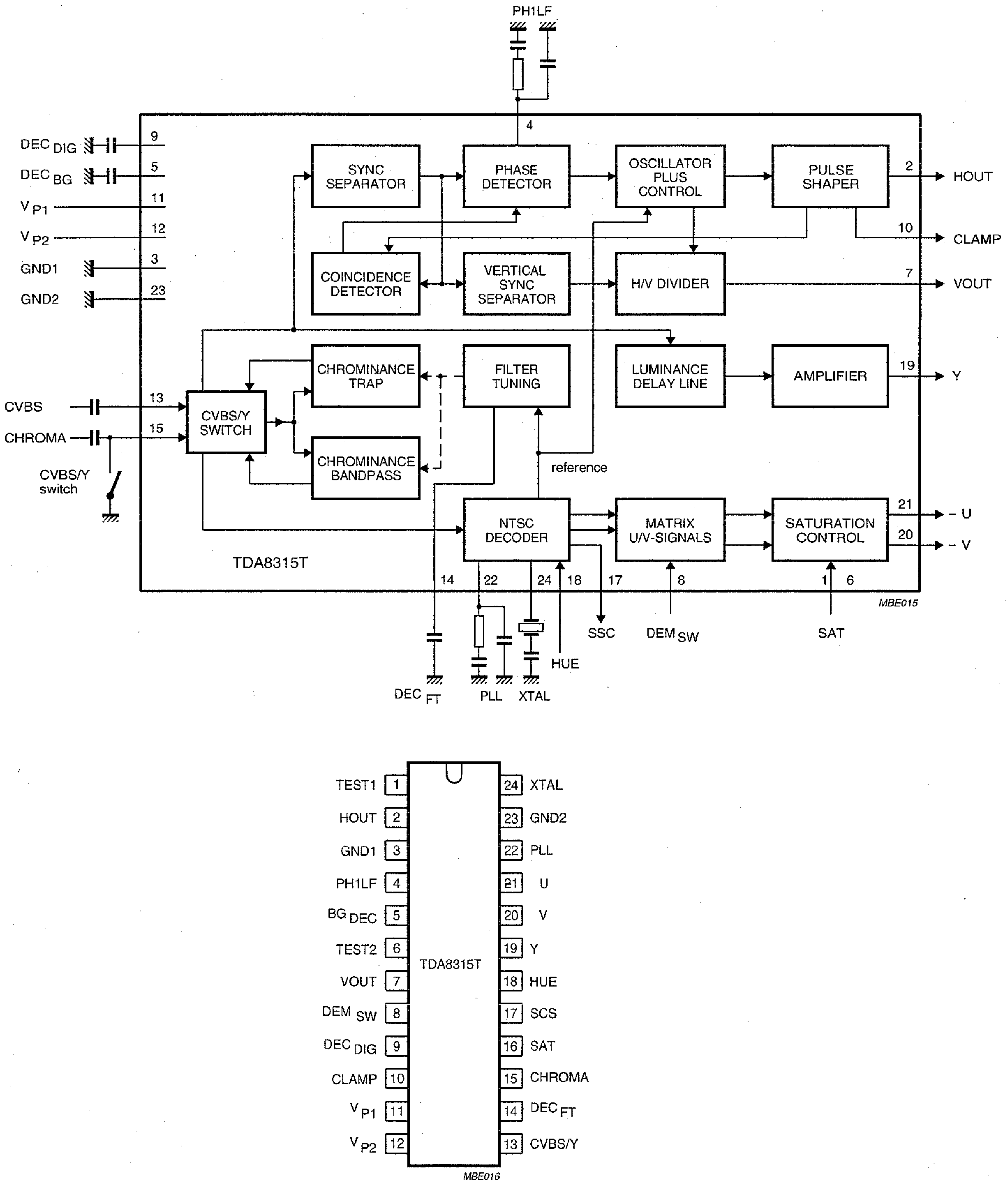
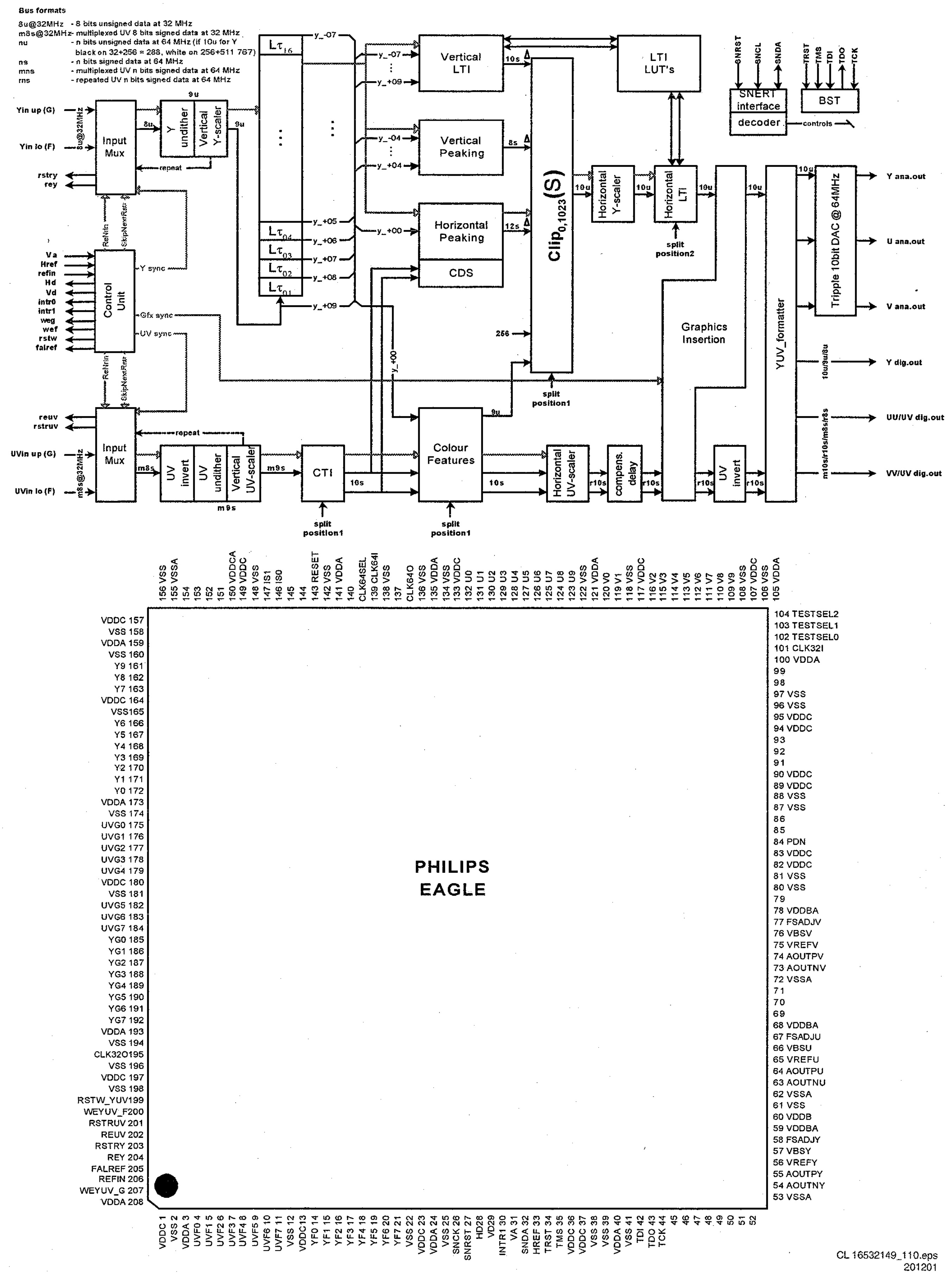

PH1LF
4
DEC DIG
9
DEC BG
5
V P1
11
V P2
12
GND1
3
GND2
23
SYNC SEPARATOR
PHASE DETECTOR
OSCILLATOR PLUS CONTROL
PULSE SHAPER
2
HOUT
10
CLAMP
COINCIDENCE DETECTOR
VERTICAL SYNC SEPARATOR
H/V DIVIDER
7
VOUT
CHROMINANCE TRAP
FILTER TUNING
LUMINANCE DELAY LINE
AMPLIFIER
19
Y
CVBS
13
CHROMA
15
CVBS/Y SWITCH
CVBS/Y switch
CHROMINANCE BANDPASS
reference
NTSC DECODER
MATRIX U/V-SIGNALS
SATURATION CONTROL
21
– U
20
– V
TDA8315T
14
22
24
18
17
8
1
6
MBE015
DEC FT
PLL
XTAL
HUE
SSC
DEM SW
SAT
TEST1 1
HOUT 2
GND1 3
PH1LF 4
BG DEC 5
TEST2 6
VOUT 7
DEM SW 8
DEC DIG 9
CLAMP 10
V P1 11
V P2 12
24 XTAL
23 GND2
22 PLL
21 U
20 V
19 Y
18 HUE
17 SCS
16 SAT
15 CHROMA
14 DEC FT
13 CVBS/Y
TDA8315T
MBE016

Figure 9-28 TDA8315T Internal Block Diagram and Pin Layout TDA8315T (NTSC Decoder)

9.10.3 Diagram L2, Eagle (IC7724)


Bus formats
8u@32MHz - 8 bits unsigned data at 32 MHz
m8s@32MHz - multiplexed UV 8 bits signed data at 32 MHz
nu - n bits unsigned data at 64 MHz (if 10u for Y black on 32+256 = 288, white on 256+511 767)
ns - n bits signed data at 64 MHz
mns - multiplexed UV n bits signed data at 64 MHz
rns - repeated UV n bits signed data at 64 MHz
Yin up (G)
Yin lo (F)
8u@32MHz
Input Mux
rstry
rey
8u
Y undither
Vertical Y-scaler
9u
repeat
ReNin
SkipNextRstr
Va
Href
refin
Hd
Vd
intr0
intr1
weg
wef
rstw
falref
Control Unit
Y sync
Gfx sync
UV sync
reuv
rstruv
UVin up (G)
UVin lo (F)
m8s@32MHz
m8s
UV invert
UV undither
Vertical UV-scaler
m9s
CTI
10s
split position1
Lτ16
Lτ04
Lτ03
Lτ02
Lτ01
y_-07
y_-04
y_+04
y_+05
y_+06
y_+07
y_+08
y_+09
y_+00
Vertical LTI
Vertical Peaking
Horizontal Peaking
CDS
Colour Features
8s
12s
256
Clip0,1023(S)
split position1
Horizontal Y-scaler
Horizontal LTI
split position2
LTI LUT's
SNRST
SNCL
SNDA
SNERT interface
decoder
controls
TRST
TMS
TDI
TDO
TCK
BST
Horizontal UV-scaler
r10s
compens. delay
Graphics Insertion
UV invert
YUV_formatter
Tripple 10bit DAC @ 64MHz
Y ana.out
U ana.out
V ana.out
10u/9u/8u
Y dig.out
UU/UV dig.out
m10s/r10s/m8s/r8s
VV/UV dig.out
PHILIPS EAGLE
156 VSS
155 VSSA
154
153
152
151
150 VDDCA
149 VDDC
148 VSS
147 IS1
146 IS0
145
144
143 RESET
142 VSS
141 VDDA
140
CLK64SEL
139 CLK64I
138 VSS
137
CLK64O
136 VSS
135 VDDA
134 VSS
133 VDDC
132 U0
131 U1
130 U2
129 U3
128 U4
127 U5
126 U6
125 U7
124 U8
123 U9
122 VSS
121 VDDA
120 V0
119 V1
118 VSS
117 VDDC
116 V2
115 V3
114 V4
113 V5
112 V6
111 V7
110 V8
109 V9
108 VSS
107 VDDC
106 VSS
105 VDDA
VDDC 157
VSS 158
VDDA 159
VSS 160
Y9 161
Y8 162
Y7 163
VDDC 164
VSS165
Y6 166
Y5 167
Y4 168
Y3 169
Y2 170
Y1 171
Y0 172
VDDA 173
VSS 174
UVG0 175
UVG1 176
UVG2 177
UVG3 178
UVG4 179
VDDC 180
VSS 181
UVG5 182
UVG6 183
UVG7 184
YG0 185
YG1 186
YG2 187
YG3 188
YG4 189
YG5 190
YG6 191
YG7 192
VDDA 193
VSS 194
CLK32O195
VSS 196
VDDC 197
VSS 198
RSTW_YUV199
WEYUV_F200
RSTRUV 201
REUV 202
RSTRY 203
REY 204
FALREF 205
REFIN 206
WEYUV_G 207
VDDA 208
104 TESTSEL2
103 TESTSEL1
102 TESTSEL0
101 CLK32I
100 VDDA
99
98
97 VSS
96 VSS
95 VDDC
94 VDDC
93
92
91
90 VDDC
89 VDDC
88 VSS
87 VSS
86
85
84 PDN
83 VDDC
82 VDDC
81 VSS
80 VSS
79
78 VDDBA
77 FSADJV
76 VBSV
75 VREFV
74 AOUTPV
73 AOUTNV
72 VSSA
71
70
69
68 VDDBA
67 FSADJU
66 VBSU
65 VREFU
64 AOUTPU
63 AOUTNU
62 VSSA
61 VSS
60 VDDB
59 VDDBA
58 FSADJY
57 VBSY
56 VREFY
55 AOUTPY
54 AOUTNY
53 VSSA
VDDC 1
VSS 2
VDDA 3
UVF0 4
UVF1 5
UVF2 6
UVF3 7
UVF4 8
UVF5 9
UVF6 10
UVF7 11
VSS 12
VDDC13
YF0 14
YF1 15
YF2 16
YF3 17
YF4 18
YF5 19
YF6 20
YF7 21
VSS 22
VDDC 23
VDDA 24
VSS 25
SNCK 26
SNRST 27
HD28
VD29
INTR1 30
VA 31
SNDA 32
HREF 33
TRST 34
TMS 35
VDDC 36
VDDC 37
VSS 38
VSS 39
VDDA 40
VSS 41
TDI 42
TDO 43
TCK 44
45
46
47
48
49
50
51
52

CL 16532149_110.eps
201201

Figure 9-29 Internal Block Diagram and Pin Layout T8F24E (Eagle)

9.10.4 Diagram L3, FALCONIC (IC7718)

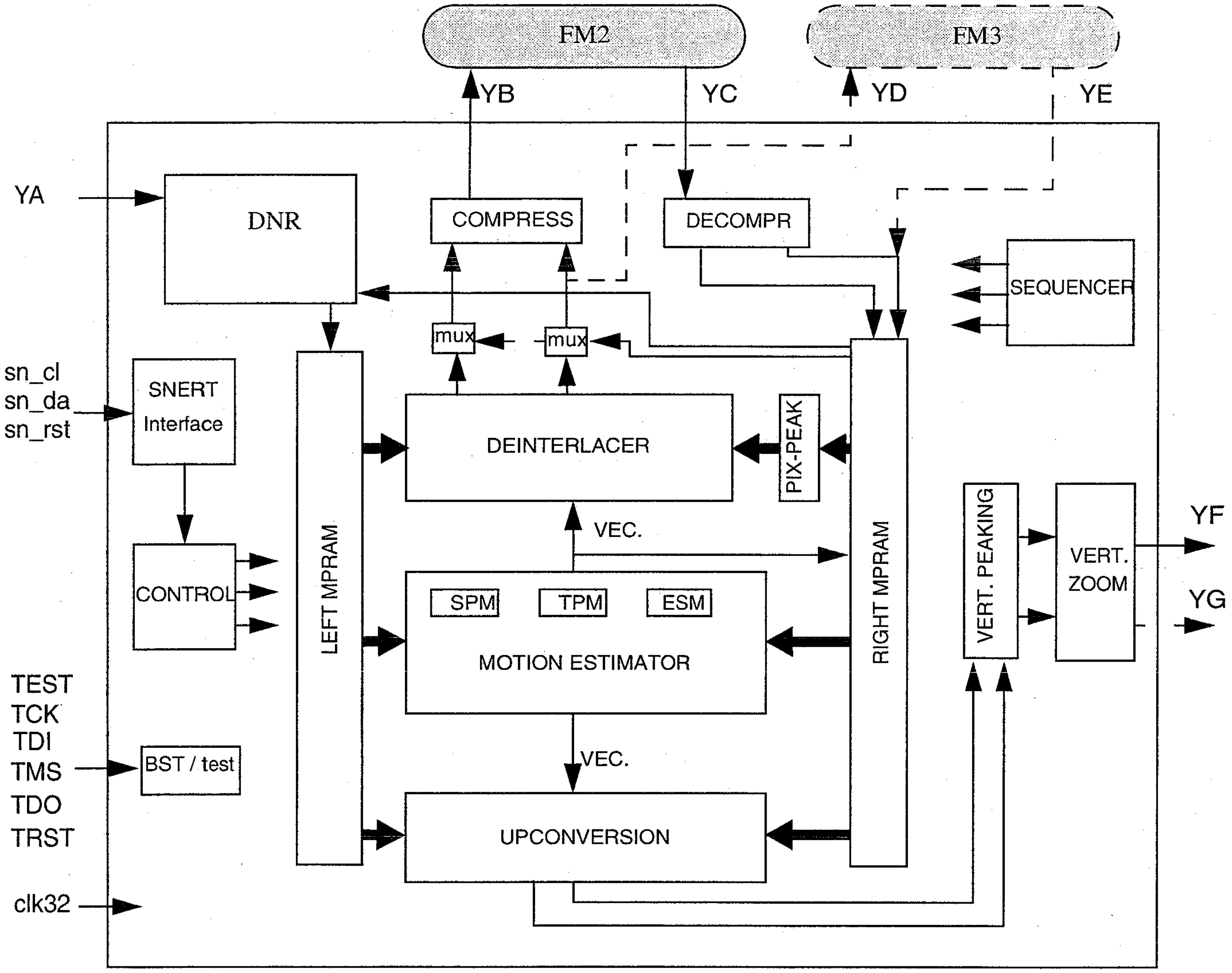

FM2
FM3
YB
YC
YD
YE
YA
DNR
COMPRESS
DECOMPR
SEQUENCER
mux
mux
sn_cl
sn_da
sn_rst
SNERT
Interface
CONTROL
LEFT MPRAM
DEINTERLACER
PIX-PEAK
RIGHT MPRAM
VEC.
SPM
TPM
ESM
MOTION ESTIMATOR
VERT. PEAKING
VERT. ZOOM
YF
YG
TEST
TCK
TDI
TMS
TDO
TRST
BST / test
VEC.
UPCONVERSION
clk32

Figure 9-30 SAA4992 Internal Block Diagram SAA4992 (FALCONIC)

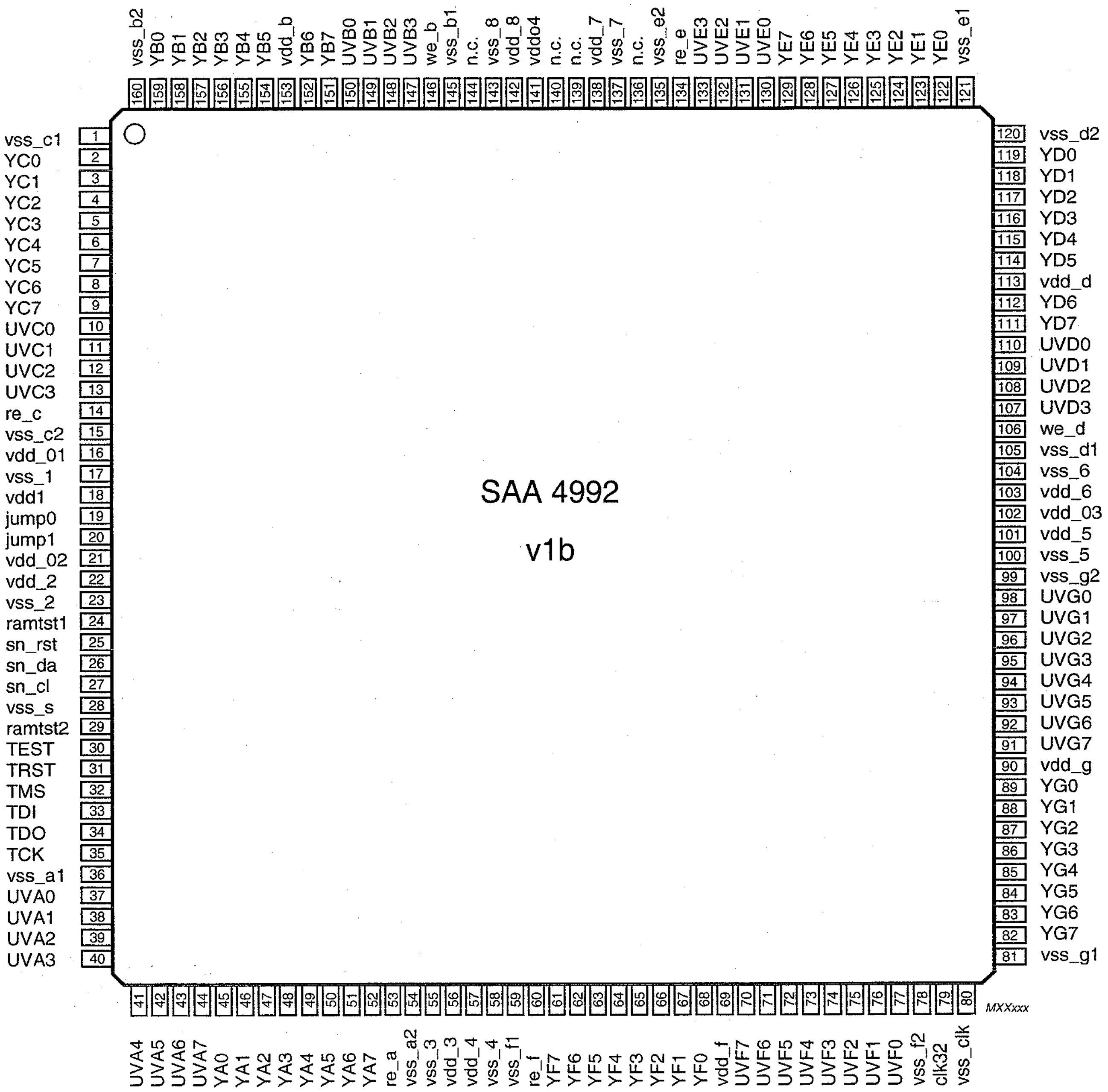

SAA 4992
v1b
1 vss_c1
2 YC0
3 YC1
4 YC2
5 YC3
6 YC4
7 YC5
8 YC6
9 YC7
10 UVC0
11 UVC1
12 UVC2
13 UVC3
14 re_c
15 vss_c2
16 vdd_01
17 vss_1
18 vdd1
19 jump0
20 jump1
21 vdd_02
22 vdd_2
23 vss_2
24 ramtst1
25 sn_rst
26 sn_da
27 sn_cl
28 vss_s
29 ramtst2
30 TEST
31 TRST
32 TMS
33 TDI
34 TDO
35 TCK
36 vss_a1
37 UVA0
38 UVA1
39 UVA2
40 UVA3
41 UVA4
42 UVA5
43 UVA6
44 UVA7
45 YA0
46 YA1
47 YA2
48 YA3
49 YA4
50 YA5
51 YA6
52 YA7
53 re_a
54 vss_a2
55 vss_3
56 vdd_3
57 vdd_4
58 vss_4
59 vss_f1
60 re_f
61 YF7
62 YF6
63 YF5
64 YF4
65 YF3
66 YF2
67 YF1
68 YF0
69 vdd_f
70 UVF7
71 UVF6
72 UVF5
73 UVF4
74 UVF3
75 UVF2
76 UVF1
77 UVF0
78 vss_f2
79 clk32
80 vss_clk
81 vss_g1
82 YG7
83 YG6
84 YG5
85 YG4
86 YG3
87 YG2
88 YG1
89 YG0
90 vdd_g
91 UVG7
92 UVG6
93 UVG5
94 UVG4
95 UVG3
96 UVG2
97 UVG1
98 UVG0
99 vss_g2
100 vss_5
101 vdd_5
102 vdd_03
103 vdd_6
104 vss_6
105 vss_d1
106 we_d
107 UVD3
108 UVD2
109 UVD1
110 UVD0
111 YD7
112 YD6
113 vdd_d
114 YD5
115 YD4
116 YD3
117 YD2
118 YD1
119 YD0
120 vss_d2
121 vss_e1
122 YE0
123 YE1
124 YE2
125 YE3
126 YE4
127 YE5
128 YE6
129 YE7
130 UVE0
131 UVE1
132 UVE2
133 UVE3
134 re_e
135 vss_e2
136 n.c.
137 vss_7
138 vdd_7
139 n.c.
140 n.c.
141 vddo4
142 vdd_8
143 vss_8
144 n.c.
145 vss_b1
146 we_b
147 UVB3
148 UVB2
149 UVB1
150 UVB0
151 YB7
152 YB6
153 vdd_b
154 YB5
155 YB4
156 YB3
157 YB2
158 YB1
159 YB0
160 vss_b2
MXXxxx

Figure 9-31 SAA4992 Pin Layout SAA4992 (FALCONIC)

10. Spare Parts List

AV Interface [AV]

Various

0011	3122 121 67161	Earth sheet
0012	3122 121 67161	Earth sheet
0301	2422 025 16984	Connector 15P F
0302	2422 026 05248	Socket cinch 3P h Bk/Wh/Rd
0303	2422 025 16984	Connector 15P F
0304	4822 267 10962	Connector 11P m v 2.50 Wh
0305	4822 267 10962	Connector 11P m v 2.50 Wh
0306	4822 267 10974	Connector 9P m v 2.50 Wh
0307	4822 267 10962	Connector 11P m v 2.50 Wh
0308	4822 267 10962	Connector 11P m v 2.50 Wh
0309	4822 267 10979	Connector 9P m v 2.50 Bk
0310	4822 267 10964	Connector 9P m v 2.50 Rd
0313	2422 026 05247	Socket cinch 3P h Or/Wh/Rd
0315	4822 267 10979	Connector 9P m v 2.50 Bk
0328	4822 267 10981	Connector 11P m v 2.50 Bk
0333	4822 267 10962	Connector 11P m v 2.50 Wh
0340	4822 267 10974	Connector 9P m v 2.50 Wh
0341	4822 267 10974	Connector 9P m v 2.50 Wh
0355	4822 267 11043	Connector 3P m v 2.50 Ye
0371	2422 025 14904	Connector 7P m v 2.50 Wh
0372	4822 267 10979	Connector 9P m v 2.50 Bk
0373	4822 267 10978	Connector 7P m v 2.50 Bk
0398	4822 267 10962	Connector 11P m v 2.50 Wh
0399	4822 267 10962	Connector 11P m v 2.50 Wh
1513▲	4822 071 52001	Fuse T0.2A 250V TR5
1519	2422 025 16571	Connector 12P m v 2.54
8008	3104 311 02681	Cable 11P/220/11P Wh
8009	3104 311 03451	Cable 9P/220/9P Bk
8015	3104 311 03441	Cable 9P/60/9P Bk
8033	3104 311 02691	Cable 11P/280/11P Wh
8071	3104 311 02601	Cable 7P/60/7P Wh

⊣⊢

2450	4822 126 14585	100nF 10% 50V
2460	4822 126 14585	100nF 10% 50V
2510	4822 124 12095	100μF 20% 16V
2511	4822 124 12095	100μF 20% 16V
2513	4822 124 12095	100μF 20% 16V
2514	4822 124 12095	100μF 20% 16V
2515	4822 126 14585	100nF 10% 50V
2519	5322 124 41945	22μF 20% 35V SMD
2520	4822 126 13482	470nF 80/20% 16V
2521	4822 126 14491	2.2μF -20+80% 10V 0805
2522	5322 122 32966	39pF 5% 50V
2523	4822 126 14491	2.2μF -20+80% 10V 0805
2524	4822 126 13693	56pF 1% 63V
2525	4822 126 14491	2.2μF -20+80% 10V 0805
2526	5322 122 32658	22pF 5% 50V
2527	4822 126 14491	2.2μF -20+80% 10V 0805
2528	5322 122 32966	39pF 5% 50V
2529	4822 126 14491	2.2μF -20+80% 10V 0805
2530	4822 126 13693	56pF 1% 63V
2531	4822 126 14491	2.2μF -20+80% 10V 0805
2532	5322 122 32658	22pF 5% 50V
2534	5322 122 32966	39pF 5% 50V
2536	4822 126 13693	56pF 1% 63V
2538	5322 122 32658	22pF 5% 50V
2542	4822 126 14585	100nF 10% 50V
2545	4822 126 14585	100nF 10% 50V
2546	4822 126 14491	2.2μF -20+80% 10V 0805
2550	4822 126 14585	100nF 10% 50V
2551	4822 124 12095	100μF 20% 16V
2570	4822 126 14585	100nF 10% 50V
2571	4822 126 14585	100nF 10% 50V
2575	4822 126 14585	100nF 10% 50V
2585	4822 126 14585	100nF 10% 50V
2587	5322 122 32268	470pF 5% 63V
2588	4822 122 33216	270pF 5% 50V
2601	5322 124 41945	22μF 20% 35V SMD
2607	4822 126 14585	100nF 10% 50V
2610	4822 126 14585	100nF 10% 50V
2622	5322 124 41945	22μF 20% 35V SMD
2642	5322 124 41945	22μF 20% 35V SMD
2655	4822 124 12095	100μF 20% 16V
2656	4822 126 14585	100nF 10% 50V
2665	4822 124 12095	100μF 20% 16V
2666	4822 126 14585	100nF 10% 50V
2707	4822 126 14076	220nF 25V. 20%
2708	4822 126 14076	220nF 25V. 20%
2710	4822 126 14585	100nF 10% 50V
2711	4822 126 14076	220nF 25V. 20%
2713	4822 126 14076	220nF 25V. 20%
2720	4822 126 14076	220nF 25V. 20%
2721	4822 126 14076	220nF 25V. 20%
2724	4822 126 14076	220nF 25V. 20%
2725	4822 126 14076	220nF 25V. 20%
2727	5322 122 32269	6.8pF 5% 50V
2729	5322 122 32269	6.8pF 5% 50V
2740	4822 126 14585	100nF 10% 50V
2748	4822 124 23002	10μF 20% 16V
2761	4822 126 13482	470nF 80/20% 16V
2765	4822 126 13482	470nF 80/20% 16V
2801	5322 122 32531	100pF 5% 50V
2805	5322 122 32531	100pF 5% 50V
2810	5322 124 41945	22μF 20% 35V SMD
2811	4822 126 14585	100nF 10% 50V
2812	5322 124 41945	22μF 20% 35V SMD
2813	4822 124 23002	10μF 20% 16V
2814	4822 124 23002	10μF 20% 16V
2819	4822 124 23002	10μF 20% 16V
2820	4822 124 23002	10μF 20% 16V
2821	4822 124 23002	10μF 20% 16V
2826	4822 124 23002	10μF 20% 16V
2827	4822 124 23002	10μF 20% 16V
2829	4822 124 23002	10μF 20% 16V
2830	4822 124 23002	10μF 20% 16V
2832	4822 124 23002	10μF 20% 16V
2835	5322 122 31863	330pF 5% 63V
2840	4822 126 14585	100nF 10% 50V
2841	5322 124 41945	22μF 20% 35V SMD
2842	5322 124 41945	22μF 20% 35V SMD
2843	5322 124 41945	22μF 20% 35V SMD
2844	5322 124 41945	22μF 20% 35V SMD
2846	5322 122 31863	330pF 5% 63V
2849	5322 122 32531	100pF 5% 50V
2850	5322 124 41945	22μF 20% 35V SMD
2880	4822 126 14585	100nF 10% 50V
2883	4822 124 23002	10μF 20% 16V

-ww-

3437	4822 051 20108	1Ω 5% 0.1W
3440	4822 117 11927	75Ω 1% 0.1W
3441	4822 117 11927	75Ω 1% 0.1W
3442	4822 117 11927	75Ω 1% 0.1W
3444	4822 117 11449	2k2 5% 0.1W 0805
3445	4822 117 11449	2k2 5% 0.1W 0805
3446	4822 117 11373	100Ω 1% 0805
3447	4822 117 11373	100Ω 1% 0805
3452	4822 117 10833	10k 1% 0.1W
3453	4822 117 10833	10k 1% 0.1W
3456	4822 117 10833	10k 1% 0.1W
3462	4822 117 10833	10k 1% 0.1W
3510▲	4822 052 10108	1Ω 5% 0.33W
3511▲	4822 052 10478	4Ω7 5% 0.33W
3512▲	4822 052 10108	1Ω 5% 0.33W
3519	4822 117 10833	10k 1% 0.1W
3520	4822 051 20822	8k2 5% 0,1W
3521	4822 051 20471	470Ω 5% 0.1W
3522	4822 051 20471	470Ω 5% 0.1W
3523	4822 117 11373	100Ω 1% 0805
3525	4822 051 20471	470Ω 5% 0.1W
3526	4822 051 20471	470Ω 5% 0.1W
3527	4822 117 11373	100Ω 1% 0805
3529	4822 051 20471	470Ω 5% 0.1W
3530	4822 051 20471	470Ω 5% 0.1W
3531	4822 117 11373	100Ω 1% 0805
3533	4822 051 10102	1k 2% 0.25W
3534	4822 051 10102	1k 2% 0.25W
3535	4822 051 10102	1k 2% 0.25W
3536	4822 117 10361	680Ω 1% 0.1W
3537	4822 117 10361	680Ω 1% 0.1W
3538	4822 117 10361	680Ω 1% 0.1W
3539	4822 051 20332	3k3 5% 0.1W
3540	4822 051 20472	4k7 5% 0.1W
3541	4822 117 10833	10k 1% 0.1W
3542	4822 117 10837	100k 1% 0.1W
3543	4822 117 10833	10k 1% 0.1W
3544	3198 021 52240	220k 5% 0805
3545	4822 051 20474	470k 5% 0.1W
3546	4822 051 10102	1k 2% 0.25W
3547	4822 117 10833	10k 1% 0.1W
3548	4822 117 10833	10k 1% 0.1W
3550	4822 051 10102	1k 2% 0.25W
3551	4822 051 10102	1k 2% 0.25W
3552	4822 051 10102	1k 2% 0.25W
3553	4822 051 20471	470Ω 5% 0.1W
3554	4822 051 20471	470Ω 5% 0.1W
3555	4822 051 20471	470Ω 5% 0.1W
3556	4822 051 10102	1k 2% 0.25W
3557	4822 051 10102	1k 2% 0.25W
3558	4822 051 10102	1k 2% 0.25W
3559	4822 117 11927	75Ω 1% 0.1W
3560	4822 117 11927	75Ω 1% 0.1W
3561	4822 117 11927	75Ω 1% 0.1W
3562	4822 117 11373	100Ω 1% 0805
3563	4822 117 11373	100Ω 1% 0805
3564	4822 117 11373	100Ω 1% 0805
3565	4822 051 20471	470Ω 5% 0.1W
3566	4822 051 20471	470Ω 5% 0.1W
3567	4822 051 20471	470Ω 5% 0.1W
3568	4822 051 20223	22k 5% 0.1W
3569	4822 117 10833	10k 1% 0.1W
3570	4822 051 10102	1k 2% 0.25W
3571	4822 117 10834	47k 1% 0.1W
3572	4822 117 10834	47k 1% 0.1W
3573	4822 117 10833	10k 1% 0.1W
3574	4822 051 20472	4k7 5% 0.1W
3575	4822 117 10833	10k 1% 0.1W
3576	4822 117 10834	47k 1% 0.1W
3577	4822 117 11507	6k8 1% 0.1W
3578	4822 117 11373	100Ω 1% 0805
3579	4822 117 11373	100Ω 1% 0805
3580	4822 117 11373	100Ω 1% 0805
3581	4822 117 10833	10k 1% 0.1W
3582	4822 117 11373	100Ω 1% 0805
3583	4822 117 11373	100Ω 1% 0805
3584	4822 116 83933	15k 1% 0.1W
3585	4822 117 10833	10k 1% 0.1W
3586	4822 051 20472	4k7 5% 0.1W
3587	4822 117 10833	10k 1% 0.1W
3588	4822 051 20273	27k 5% 0.1W
3589	4822 117 11449	2k2 5% 0.1W 0805
3590	4822 117 10833	10k 1% 0.1W
3591	4822 051 20108	1Ω 5% 0.1W
3592	4822 051 20472	4k7 5% 0.1W
3593	4822 051 10102	1k 2% 0.25W
3594	4822 051 20333	33k 5% 0.1W
3595	4822 051 20472	4k7 5% 0.1W
3596	4822 051 20472	4k7 5% 0.1W
3597	4822 117 11449	2k2 5% 0.1W 0805
3598	4822 051 20332	3k3 5% 0.1W
3599	4822 051 10102	1k 2% 0.25W
3602	4822 117 11373	100Ω 1% 0805
3603	4822 051 20223	22k 5% 0.1W
3605	4822 051 20561	560Ω 5% 0.1W
3606	4822 051 20122	1.2kΩ 5% 0.1W
3608	4822 051 20122	1.2kΩ 5% 0.1W
3609	4822 117 11454	820Ω 1% 0,1W
3610	4822 117 11454	820Ω 1% 0,1W
3615	4822 117 10833	10k 1% 0.1W
3622	4822 117 11373	100Ω 1% 0805
3623	4822 051 20223	22k 5% 0.1W
3625	4822 051 20561	560Ω 5% 0.1W
3626	4822 051 20332	3k3 5% 0.1W
3627	5322 117 12487	1k 1% 0.125W
3628	4822 117 11596	390Ω 1% 0,1W
3629	5322 117 12487	1k 1% 0.125W
3630	5322 117 12487	1k 1% 0.125W
3631	4822 051 20471	470Ω 5% 0.1W
3642	4822 117 11373	100Ω 1% 0805
3643	4822 051 20223	22k 5% 0.1W
3645	4822 051 20561	560Ω 5% 0.1W
3648	4822 117 11449	2k2 5% 0.1W 0805
3649	4822 051 20122	1.2kΩ 5% 0.1W
3650	4822 117 11449	2k2 5% 0.1W 0805
3651	4822 051 20122	1.2kΩ 5% 0.1W
3666	4822 051 20471	470Ω 5% 0.1W
3691	4822 051 20108	1Ω 5% 0.1W
3706	4822 051 20399	39Ω 5% 0.1W
3707	4822 117 11503	220Ω 1% 0.1W
3708	4822 117 11503	220Ω 1% 0.1W
3710	4822 051 20399	39Ω 5% 0.1W
3711	4822 051 20399	39Ω 5% 0.1W
3712	4822 117 10837	100k 1% 0.1W
3713	4822 051 20399	39Ω 5% 0.1W
3714	4822 117 10837	100k 1% 0.1W
3716	4822 117 10837	100k 1% 0.1W
3718	4822 117 10837	100k 1% 0.1W
3720	4822 117 11448	180Ω 1% 0.1W
3722	4822 117 11373	100Ω 1% 0805
3723	4822 117 11373	100Ω 1% 0805
3724	4822 117 11448	180Ω 1% 0.1W
3725	4822 117 11448	180Ω 1% 0.1W
3726	4822 117 10834	47k 1% 0.1W
3727	4822 117 12955	2k7 1% 0.1W 0805
3728	4822 117 10834	47k 1% 0.1W
3729	4822 117 12955	2k7 1% 0.1W 0805
3730	4822 117 11503	220Ω 1% 0.1W
3732	4822 117 11503	220Ω 1% 0.1W
3733	4822 117 11503	220Ω 1% 0.1W

3743	4822 051 20223	22k 5% 0.1W
3744	4822 117 10833	10k 1% 0.1W
3745	4822 117 10833	10k 1% 0.1W
3746	4822 117 10833	10k 1% 0.1W
3747	4822 117 11507	6k8 1% 0.1W
3748	4822 117 10834	47k 1% 0.1W
3749	4822 051 20474	470k 5% 0.1W
3750	4822 051 20472	4k7 5% 0.1W
3752	4822 051 20472	4k7 5% 0.1W
3754	4822 051 20229	22Ω 5% 0.1W
3755	4822 051 20229	22Ω 5% 0.1W
3756	4822 051 20229	22Ω 5% 0.1W
3757	4822 051 20229	22Ω 5% 0.1W
3760	4822 117 11449	2k2 5% 0.1W 0805
3761	4822 051 10102	1k 2% 0.25W
3762	4822 117 11449	2k2 5% 0.1W 0805
3763	4822 051 10102	1k 2% 0.25W
3764	4822 117 11449	2k2 5% 0.1W 0805
3765	4822 051 10102	1k 2% 0.25W
3766	4822 117 11449	2k2 5% 0.1W 0805
3767	4822 051 10102	1k 2% 0.25W
3768	4822 051 20822	8k2 5% 0,1W
3769	4822 051 20822	8k2 5% 0,1W
3773	4822 051 20108	1Ω 5% 0.1W
3800	4822 051 10102	1k 2% 0.25W
3801	4822 051 20332	3k3 5% 0.1W
3802	4822 117 10833	10k 1% 0.1W
3803	4822 051 20333	33k 5% 0.1W
3805	4822 051 10102	1k 2% 0.25W
3806	4822 051 20332	3k3 5% 0.1W
3807	4822 117 10833	10k 1% 0.1W
3808	4822 051 20333	33k 5% 0.1W
3822	4822 117 11373	100Ω 1% 0805
3824	4822 117 11373	100Ω 1% 0805
3835	4822 117 10833	10k 1% 0.1W
3836	4822 051 20154	150k 5% 0.1W
3837	4822 051 20333	33k 5% 0.1W
3841	3198 021 52240	220k 5% 0805
3842	3198 021 52240	220k 5% 0805
3843	4822 117 13577	330Ω 1% 0805 1.25W
3844	4822 117 13577	330Ω 1% 0805 1.25W
3845	4822 117 10353	150Ω 1% 0.1W
3846	3198 021 52240	220k 5% 0805
3847	4822 117 10353	150Ω 1% 0.1W
3848	3198 021 52240	220k 5% 0805
3849	4822 051 10102	1k 2% 0.25W
3850	4822 051 10102	1k 2% 0.25W
3851	4822 051 20333	33k 5% 0.1W
3852	4822 117 10834	47k 1% 0.1W
3854	4822 117 10834	47k 1% 0.1W
3861	4822 117 10833	10k 1% 0.1W
3862	4822 117 10834	47k 1% 0.1W
3865	4822 117 10834	47k 1% 0.1W
3867	4822 117 10837	100k 1% 0.1W
3868	4822 117 10837	100k 1% 0.1W
3869	4822 117 10837	100k 1% 0.1W
3870	4822 117 10837	100k 1% 0.1W
3875	4822 117 10834	47k 1% 0.1W
3876	4822 117 11373	100Ω 1% 0805
3880	4822 117 10833	10k 1% 0.1W
3881	4822 117 11373	100Ω 1% 0805
3882	4822 117 11373	100Ω 1% 0805
3883	4822 051 20474	470k 5% 0.1W
3894	4822 117 11449	2k2 5% 0.1W 0805
3895	4822 117 11449	2k2 5% 0.1W 0805
4408	4822 051 20008	Jumper 0805
4410	4822 051 20008	Jumper 0805
4412	4822 051 20008	Jumper 0805
4450	4822 051 20008	Jumper 0805
4451	4822 051 20008	Jumper 0805
4742	4822 051 20008	Jumper 0805

-∿-

5450	4822 157 11074	Bead 600Ω at 100MHz
5513	4822 157 11074	Bead 600Ω at 100MHz
5520	4822 157 11074	Bead 600Ω at 100MHz
5523	3198 018 33980	3.9µH 10% 0805
5525	2422 535 94198	3.3µH 10% 0805
5529	3198 018 33980	3.9µH 10% 0805
5531	2422 535 94198	3.3µH 10% 0805
5535	3198 018 33980	3.9µH 10% 0805
5537	2422 535 94198	3.3µH 10% 0805
5545	4822 157 11074	Bead 600Ω at 100MHz
5550	4822 157 11074	Bead 600Ω at 100MHz
5570	4822 157 11074	Bead 600Ω at 100MHz
5575	4822 157 11074	Bead 600Ω at 100MHz
5585	4822 157 11074	Bead 600Ω at 100MHz
5610	4822 157 11074	Bead 600Ω at 100MHz
5655	4822 157 11074	Bead 600Ω at 100MHz
5710	4822 157 11074	Bead 600Ω at 100MHz
5740	4822 157 11074	Bead 600Ω at 100MHz
5810	4822 157 11074	Bead 600Ω at 100MHz
5840	4822 157 11074	Bead 600Ω at 100MHz
5880	4822 157 11074	Bead 600Ω at 100MHz

-▷|-

6440	9322 149 10685	BZM55-C33
6441	9322 149 10685	BZM55-C33
6442	9322 149 10685	BZM55-C33
6444	9322 149 10685	BZM55-C33
6445	9322 149 10685	BZM55-C33
6450	4822 130 11528	1PS76SB10
6513	4822 130 11528	1PS76SB10
6559	9322 149 10685	BZM55-C33
6560	9322 149 10685	BZM55-C33
6561	9322 149 10685	BZM55-C33
6570	4822 130 11528	1PS76SB10
6571	4822 130 11528	1PS76SB10
6578	9322 149 10685	BZM55-C33
6579	9322 149 10685	BZM55-C33
6580	9322 149 10685	BZM55-C33
6581	9322 149 10685	BZM55-C33
6582	9322 149 10685	BZM55-C33
6583	9322 149 10685	BZM55-C33
6584	9322 149 10685	BZM55-C33
6595	4822 130 11528	1PS76SB10
6666	4822 130 11397	BAS316
6667	9322 129 35685	BZM55-C4V7
6740	4822 130 11528	1PS76SB10
6741	4822 130 11397	BAS316
6748	4822 130 11397	BAS316
6801	9322 149 10685	BZM55-C33
6802	9322 149 10685	BZM55-C33
6805	9322 149 10685	BZM55-C33
6806	9322 149 10685	BZM55-C33
6835	4822 130 11397	BAS316
6845	9322 149 10685	BZM55-C33
6846	9322 149 10685	BZM55-C33
6847	9322 149 10685	BZM55-C33
6848	9322 149 10685	BZM55-C33
6849	9322 149 10685	BZM55-C33
6850	9322 149 10685	BZM55-C33
6862	4822 130 11397	BAS316
6867	4822 130 11397	BAS316
6868	4822 130 11397	BAS316
6869	4822 130 11397	BAS316
6870	4822 130 11397	BAS316
6875	4822 130 11397	BAS316
6876	9322 149 10685	BZM55-C33

⊗▭

7450	5322 209 11598	PC74HCT4538T
7453	5322 130 60159	BC846B
7460	4822 209 30212	PC74HCT125T
7520	4822 209 12776	TDA8601T/C1
7540	4822 209 73852	PMBT2369
7545	4822 209 71585	74HCT4538N
7546	4822 209 73852	PMBT2369
7550	9322 145 66668	TSH93ID
7568	5322 130 60159	BC846B
7570	5322 209 11598	PC74HCT4538T
7571	5322 130 60159	BC846B
7573	4822 209 73852	PMBT2369
7575	5322 209 71568	PC74HCT14T
7587	5322 130 60159	BC846B
7589	4822 209 73852	PMBT2369
7603	5322 130 60159	BC846B
7607	9322 145 66668	TSH93ID
7610	4822 209 60792	74HC4053D
7615	4822 130 61553	DTC124EU
7623	5322 130 60159	BC846B
7643	5322 130 60159	BC846B
7710	9322 105 08668	TEA6415CD
7740	5322 209 11598	PC74HCT4538T
7745	5322 130 60159	BC846B
7746	5322 130 60159	BC846B
7749	5322 130 60159	BC846B
7751	4822 130 61553	DTC124EU
7761	5322 130 60159	BC846B
7763	5322 130 60159	BC846B
7765	5322 130 60159	BC846B
7767	5322 130 60159	BC846B
7810	9322 116 87668	TEA6422D
7835	5322 130 60159	BC846B
7838	4822 130 61553	DTC124EU
7840	4822 209 60792	74HC4053D
7853	4822 130 61553	DTC124EU
7862	4822 130 60373	BC856B
7865	4822 130 60373	BC856B
7867	9340 547 13215	BSH103
7868	9340 547 13215	BSH103
7869	9340 547 13215	BSH103
7870	9340 547 13215	BSH103
7880	5322 209 33172	PCF8574AT
7881	5322 130 60159	BC846B
7884	4822 130 61553	DTC124EU

2D Comb Filter [CF]

Various

0010	2422 025 17024	CON BM V 14P M
0010	3122 128 14011	IC foot assy
0011	2422 025 17024	CON BM V 14P M
0011	2422 486 80897	CON BM IC V 28P F
0012	2422 025 17024	CON BM V 14P M
0012	2422 486 80897	CON BM IC V 28P F

-||-

2000	5322 122 31647	1nF 10% 63V
2002	4822 126 14585	100nF 10% 50V
2003	4822 126 14585	100nF 10% 50V

-WW-

3004	4822 051 10102	1k 2% 0.25W
3999	4822 051 10102	1k 2% 0.25W
4000	4822 051 20008	Jumper 0805
4003	4822 051 20008	Jumper 0805

-∿-

5000	4822 157 71314	10µH 5% 1210
5001	4822 157 71314	10µH 5% 1210

⊗▭

7000	4822 130 60373	BC856B
7002	9352 630 99118	TDA9181T

Front Panel [FP1]

Various

0012	3122 358 76351	Led holder IR
0301	4822 265 10838	Socket phono 1P f v 3.5mm
0305	2422 026 05256	Socket SVHS 4P f v
0308	2422 025 12494	Connector 11P m h 2.50
0309	2422 025 16688	Connector 9P m h 2.50
0344	4822 267 10748	Connector 3p m
1006	4822 276 14007	Switch 2P 0.1A 12V
1008	4822 276 13732	Tact switch
1010	4822 276 13732	Tact switch
1012	4822 276 13732	Tact switch
1014	4822 276 13732	Tact switch
1016	4822 276 13732	Tact switch
1302	4822 265 10643	Socket cinch Re
1303	4822 265 10642	Socket cinch Wh
1304	4822 265 10641	Socket cinch Ye

-||-

2005	5322 122 34098	10nF 10% 63V
2020	4822 124 41643	100µF 20% 16V
2025	4822 124 41643	100µF 20% 16V
2026	4822 124 41643	100µF 20% 16V
2040	4822 126 14076	220nF 25V. 20%
2048	4822 126 12105	33nF 5% 50V
2050	4822 126 14585	100nF 10% 50V
2053	4822 124 22652	2.2µF 20% 50V
2055	4822 126 14585	100nF 10% 50V
2056	4822 126 14585	100nF 10% 50V
2057	5322 122 34098	10nF 10% 63V
2060	5322 122 31863	330pF 5% 63V
2061	5322 122 32531	100pF 5% 50V
2065	5322 122 31863	330pF 5% 63V
2066	5322 122 32531	100pF 5% 50V
2072	5322 122 34098	10nF 10% 63V
2075	5322 122 34098	10nF 10% 63V

-WW-

3001	4822 051 20332	3k3 5% 0.1W
3002	2322 194 63109	10Ω 5% 2W
3003	2322 194 63109	10Ω 5% 2W
3008	4822 051 10102	1k 2% 0.25W
3009	4822 051 10102	1k 2% 0.25W
3010	4822 051 10102	1k 2% 0.25W

3011	4822 117 11373	100Ω 1% 0805
3012	4822 051 20471	470Ω 5% 0.1W
3013	4822 117 10353	150Ω 1% 0.1W
3014	4822 117 11373	100Ω 1% 0805
3015	4822 117 11373	100Ω 1% 0805
3016	4822 117 11504	270Ω 1% 0.1W
3017	4822 051 20121	120Ω 5% 0,1W
3020	4822 052 10108	1Ω 5% 0.33W
3025	4822 117 13577	330Ω 1% 0805 1.25W
3026	4822 117 13577	330Ω 1% 0805 1.25W
3027	4822 117 11507	6k8 1% 0.1W
3029	4822 051 20471	470Ω 5% 0.1W
3030	4822 051 20561	560Ω 5% 0.1W
3039	4822 117 11373	100Ω 1% 0805
3040	4822 051 20472	4k7 5% 0.1W
3041	4822 117 10833	10k 1% 0.1W
3042	4822 117 10833	10k 1% 0.1W
3044	4822 051 20332	3k3 5% 0.1W
3045	4822 051 20562	5k6 5% 0.1W 0805
3046	4822 051 20108	1Ω 5% 0.1W
3048	4822 051 20108	1Ω 5% 0.1W
3049	4822 051 20154	150k 5% 0.1W
3050	4822 051 20684	680k 5% 0.1W
3051	4822 051 20393	39k 5% 0.1W
3052	4822 051 20392	3k9 5% 0.1W
3053	4822 117 11449	2k2 5% 0.1W 0805
3055	4822 117 10837	100k 1% 0.1W
3060	4822 051 10102	1k 2% 0.25W
3061	4822 051 20333	33k 5% 0.1W
3062	4822 051 20332	3k3 5% 0.1W
3063	4822 117 10833	10k 1% 0.1W
3065	4822 051 10102	1k 2% 0.25W
3066	4822 051 20333	33k 5% 0.1W
3067	4822 051 20332	3k3 5% 0.1W
3068	4822 117 10833	10k 1% 0.1W
3070	4822 051 20121	120Ω 5% 0,1W
3071	4822 051 20121	120Ω 5% 0,1W
3072	4822 117 10833	10k 1% 0.1W
3073	4822 051 20121	120Ω 5% 0,1W
3074	4822 051 20121	120Ω 5% 0,1W
3075	4822 117 10833	10k 1% 0.1W
3999	4822 051 20393	39k 5% 0.1W
4005	4822 051 20008	Jumper 0805
4006	4822 051 20008	Jumper 0805
4063	4822 051 20008	Jumper 0805
4065	4822 051 20008	Jumper 0805

-▶|-

6001	9340 548 47115	PDZ3.3B
6002	9322 127 27676	TSAL5300
6012	9322 155 82667	IR receiver TSOP2236
6025	9322 155 82667	IR receiver TSOP2236
6030	9322 147 06676	Led LTL-1BEHJ
6040	9340 548 71115	SM PDZ33B
6041	9340 548 71115	SM PDZ33B
6046	9340 548 71115	SM PDZ33B
6047	9340 548 71115	SM PDZ33B
6060	9340 548 71115	SM PDZ33B
6061	9340 548 71115	SM PDZ33B
6065	9340 548 71115	SM PDZ33B
6066	9340 548 71115	SM PDZ33B
6070	9340 548 71115	SM PDZ33B
6071	9340 548 71115	SM PDZ33B
6072	9340 548 71115	SM PDZ33B
6073	9340 548 71115	SM PDZ33B

⊗▭

7001	4822 130 41246	BC327-25
7044	5322 130 60159	BC846B
7051	4822 130 60373	BC856B
7052	4822 130 60373	BC856B
7055	9322 165 94668	TPS2014P

Small Signal Panel [K]

Various

0002	2422 486 80873	IC socket 42P DIL
0008	2422 486 80928	IC socket 8P DIL
0310	4822 267 10964	Connector 9P m v 2.50 Rd
0315	4822 267 10979	Connector 9P m v 2.50 Bk
0328	4822 267 10981	Connector 11P m v 2.50 Bk
0333	4822 267 10962	Connector 11P m v 2.50 Wh
0340	4822 267 10974	Connector 9P m v 2.50 Wh
0341	4822 267 10974	Connector 9P m v 2.50 Wh
0348	4822 267 11043	Connector 3P m v 2.50 Ye
0351	4822 267 10962	Connector 11P m v 2.50 Wh
0352	4822 267 10962	Connector 11P m v 2.50 Wh
0353	4822 267 10974	Connector 9P m v 2.50 Wh
0355	4822 267 11043	Connector 3P m v 2.50 Ye
0356	4822 267 10963	Connector 3P m v 2.50 Wh
0360	4822 267 10967	Connector 3P m v 2.50 Bk
0361	4822 267 10974	Connector 9P m v 2.50 Wh
0362	4822 267 10974	Connector 9P m v 2.50 Wh
0371	2422 025 14904	Connector 7P m v 2.50 Wh
0372	4822 267 10979	Connector 9P m v 2.50 Bk
0373	4822 267 10978	Connector 7P m v 2.50 Bk
1001	4822 242 10972	Crystal 6MHz
1101	3139 147 20221	Splitter PS1318/I
1102▲	3139 147 20181	Tuner UV1318S/A P-3
1105	4822 242 10688	Filter OFWK9456M
1107	4822 242 72211	Filter 5.5 MHz
1109	4822 242 81436	Filter OFWK3953M
1198	3104 301 08351	Cablephono-phono 120mm
1200	2422 026 05254	Socket cinch 2P f h Wh/Rd
1201	4822 267 10771	Socket 2 x SCART
1202	4822 267 10771	Socket 2 x SCART
1305	5322 242 73686	Crystal 12 MHz
1525	4822 242 10695	Crystal 4.433 619 MHz
1528	4822 242 10697	Crystal 3.579 545 MHz
1751	4822 242 10434	Crystal 18.432 MHz
8010	3104 311 03781	Cable 9P/280/9P Rd
8040	3104 311 02621	Cable 9P/100/9P Wh
8051	3104 311 02661	Cable 11P/120/11P Wh
8052	3104 311 02661	Cable 11P/120/11P Wh
8053	3104 311 02631	Cable 9P/120/9P Wh
8061	3104 311 02621	Cable 9P/100/9P Wh
8062	3104 311 02621	Cable 9P/100/9P Wh
8072	3104 311 03441	Cable 9P/60/9P Bk

⊣⊢

2001	4822 126 13482	470nF 80/20% 16V
2002	2238 586 59812	100nF 20-80% 50V 0603
2003	2238 586 59812	100nF 20-80% 50V 0603
2005	2238 586 59812	100nF 20-80% 50V 0603
2006	2238 586 59812	100nF 20-80% 50V 0603
2008	2238 586 59812	100nF 20-80% 50V 0603
2009	2238 586 59812	100nF 20-80% 50V 0603
2010	2238 586 59812	100nF 20-80% 50V 0603
2011	2238 586 59812	100nF 20-80% 50V 0603
2012	2238 586 59812	100nF 20-80% 50V 0603
2013	4822 126 14076	220nF 25V. 20%
2014	4822 126 11669	27pF 5% 50V 0603
2015	4822 126 14585	100nF 10% 50V
2016	2238 861 18339	33pF 1% 50V
2021	4822 126 14585	100nF 10% 50V
2022	4822 126 14076	220nF 25V. 20%
2023	2238 586 59812	100nF 20-80% 50V 0603
2024	5322 126 11578	1nF 10% 50V 0603
2025	2238 586 59812	100nF 20-80% 50V 0603
2026	2238 586 59812	100nF 20-80% 50V 0603
2027	2238 586 59812	100nF 20-80% 50V 0603
2028	2238 586 59812	100nF 20-80% 50V 0603
2029	4822 124 40433	47µF 20% 25V
2030	4822 124 40433	47µF 20% 25V
2031	2238 586 59812	100nF 20-80% 50V 0603
2032	2238 586 59812	100nF 20-80% 50V 0603
2035	4822 126 14585	100nF 10% 50V
2037	4822 126 14585	100nF 10% 50V
2038	4822 126 14585	100nF 10% 50V
2039	4822 126 13883	220pF 5% 50V
2040	4822 122 33177	10nF 20% 50V
2042	4822 126 11785	47pF 5% 50V 0603
2043	4822 126 11785	47pF 5% 50V 0603
2044	4822 126 11785	47pF 5% 50V 0603
2045	4822 124 41584	100µF 20% 10V
2046	4822 126 14585	100nF 10% 50V
2049	4822 126 14226	82pF 5% 50V 0603
2050	4822 126 14226	82pF 5% 50V 0603
2051	4822 126 14226	82pF 5% 50V 0603
2052	4822 126 14226	82pF 5% 50V 0603
2053	4822 126 14226	82pF 5% 50V 0603
2054	4822 126 14226	82pF 5% 50V 0603
2101	4822 124 40196	220µF 20% 16V
2102	4822 126 13473	220nF 80-20% 50V
2104	4822 122 33177	10nF 20% 50V
2105	4822 122 33177	10nF 20% 50V
2106	4822 122 33575	220pF 5% 63V
2107	4822 126 13694	68pF 1% 63V
2108	5322 122 31873	2.7pF 5% 100V
2109	4822 124 22652	2.2µF 20% 50V
2110	4822 124 21913	1µF 20% 63V
2111	4822 126 14585	100nF 10% 50V
2112	4822 122 33891	3.3nF 10% 63V
2116	4822 124 81044	470µF 20% 6.3V
2117	4822 126 13482	470nF 80/20% 16V
2118	5322 122 32967	5.6pF 10% 63V
2119	5322 122 31863	330pF 5% 63V
2120	4822 126 14076	220nF 25V. 20%
2121	4822 124 40248	10µF 20% 63V
2125	4822 122 33177	10nF 20% 50V
2126	4822 124 40433	47µF 20% 25V
2127	4822 126 14076	220nF 25V. 20%
2202	5322 122 31863	330pF 5% 63V
2203	5322 122 31863	330pF 5% 63V
2204	2238 586 59812	100nF 20-80% 50V 0603
2205	4822 124 40248	10µF 20% 63V
2206	5322 122 32531	100pF 5% 50V
2209	5322 122 31863	330pF 5% 63V
2210	5322 122 32531	100pF 5% 50V
2212	4822 124 40248	10µF 20% 63V
2213	2238 586 59812	100nF 20-80% 50V 0603
2215	5322 122 31863	330pF 5% 63V
2216	5322 122 31863	330pF 5% 63V
2217	5322 122 32531	100pF 5% 50V
2219	5322 122 31863	330pF 5% 63V
2220	5322 122 32531	100pF 5% 50V
2221	4822 126 14076	220nF 25V. 20%
2222	4822 124 81286	47µF 20% 16V
2224	5322 122 32531	100pF 5% 50V
2226	5322 122 32531	100pF 5% 50V
2228	5322 122 31863	330pF 5% 63V
2229	5322 122 31863	330pF 5% 63V
2240	5322 122 32531	100pF 5% 50V
2241	5322 122 32531	100pF 5% 50V
2242	4822 124 23002	10µF 20% 16V
2243	4822 126 14076	220nF 25V. 20%
2244	4822 126 14076	220nF 25V. 20%
2245	4822 126 14076	220nF 25V. 20%
2246	4822 126 14076	220nF 25V. 20%
2247	4822 126 14076	220nF 25V. 20%
2248	4822 126 14076	220nF 25V. 20%
2249	4822 126 14076	220nF 25V. 20%
2250	4822 126 14076	220nF 25V. 20%
2251	4822 124 80151	47µF 20% 16V
2252	4822 126 14076	220nF 25V. 20%
2253	4822 126 14076	220nF 25V. 20%
2254	4822 126 14076	220nF 25V. 20%
2255	4822 126 14076	220nF 25V. 20%
2256	4822 126 14076	220nF 25V. 20%
2257	4822 126 14076	220nF 25V. 20%
2258	4822 126 14076	220nF 25V. 20%
2259	4822 126 14076	220nF 25V. 20%
2300	4822 124 40196	220µF 20% 16V
2301	4822 126 14585	100nF 10% 50V
2302	4822 126 14585	100nF 10% 50V
2303	4822 124 22652	2.2µF 20% 50V
2304	2238 586 59812	100nF 20-80% 50V 0603
2307	4822 122 33741	10pF 10% 50V
2308	4822 122 33741	10pF 10% 50V
2311	4822 124 40196	220µF 20% 16V
2312	2238 586 59812	100nF 20-80% 50V 0603
2321	4822 126 13881	470pF 5% 50V
2322	4822 126 13881	470pF 5% 50V
2331	5322 126 11583	10nF 10% 50V 0603
2340	4822 126 13881	470pF 5% 50V
2343	2238 861 18109	10pF 1% 50V
2344	2238 586 59812	100nF 20-80% 50V 0603
2351	2020 552 96326	220nF 10% 16V
2403	4822 126 14585	100nF 10% 50V
2404	4822 126 14585	100nF 10% 50V
2405	4822 126 14585	100nF 10% 50V
2406	2238 586 59812	100nF 20-80% 50V 0603
2407	2238 586 59812	100nF 20-80% 50V 0603
2408	2238 586 59812	100nF 20-80% 50V 0603
2410	2238 586 59812	100nF 20-80% 50V 0603
2411	2238 586 59812	100nF 20-80% 50V 0603
2412	2238 586 59812	100nF 20-80% 50V 0603
2422	4822 124 22652	2.2µF 20% 50V
2423	4822 124 40769	4.7µF 20% 100V
2425	4822 122 33761	22pF 5% 50V
2427	5322 126 10511	1nF 5% 50V
2428	4822 126 11663	12pF 5% 50V 0603
2429	4822 126 11663	12pF 5% 50V 0603
2430	4822 122 33926	12pF 5% 50V 0805
2436	4822 124 80151	47µF 20% 16V
2501	2238 586 59812	100nF 20-80% 50V 0603
2502	2238 586 59812	100nF 20-80% 50V 0603
2503	2238 586 59812	100nF 20-80% 50V 0603
2504	2238 586 59812	100nF 20-80% 50V 0603
2505	2238 586 59812	100nF 20-80% 50V 0603
2506	2238 586 59812	100nF 20-80% 50V 0603
2507	2238 586 59812	100nF 20-80% 50V 0603
2508	2238 586 59812	100nF 20-80% 50V 0603
2509	2238 586 59812	100nF 20-80% 50V 0603
2510	2238 586 59812	100nF 20-80% 50V 0603
2511	2238 586 59812	100nF 20-80% 50V 0603
2512	2238 586 59812	100nF 20-80% 50V 0603
2520	2238 586 59812	100nF 20-80% 50V 0603
2521	2238 586 59812	100nF 20-80% 50V 0603
2522	5322 126 11579	3.3nF 10% 63V
2525	4822 126 14507	18pF 5% 50V 0603
2528	4822 122 33752	15pF 5% 50V
2532	4822 126 14043	1µF 20% 16V
2534	5322 126 10223	4.7nF 10% 63V

2535	4822 126 14491	2.2µF -20+80% 10V 0805
2536	4822 126 14585	100nF 10% 50V
2537	4822 126 14585	100nF 10% 50V
2538	4822 124 40433	47µF 20% 25V
2539	2238 586 59812	100nF 20-80% 50V 0603
2540	4822 124 40433	47µF 20% 25V
2541	5322 122 32654	22nF 10% 63V
2545	2238 586 59812	100nF 20-80% 50V 0603
2550	2238 586 59812	100nF 20-80% 50V 0603
2553	4822 126 14585	100nF 10% 50V
2554	4822 126 14585	100nF 10% 50V
2555	2238 586 59812	100nF 20-80% 50V 0603
2556	4822 126 14585	100nF 10% 50V
2557	2238 586 59812	100nF 20-80% 50V 0603
2558	2238 586 59812	100nF 20-80% 50V 0603
2560	2238 586 59812	100nF 20-80% 50V 0603
2561	4822 124 81286	47µF 20% 16V
2562	2238 586 59812	100nF 20-80% 50V 0603
2564	4822 122 33177	10nF 20% 50V
2567	5322 126 10733	680pF 5% 50V
2568	2020 552 94427	100pF 5% 50v 0603
2569	4822 122 33177	10nF 20% 50V
2570	2020 552 94427	100pF 5% 50v 0603
2572	2020 004 90283	10µF 20% 10V 1206
2751	2238 586 59812	100nF 20-80% 50V 0603
2752	4822 126 13692	47pF 1% 63V
2753	4822 122 32927	220nF 20% 50V
2754	5322 122 32268	470pF 5% 63V
2755	5322 122 32268	470pF 5% 63V
2756	5322 122 32268	470pF 5% 63V
2757	5322 122 32268	470pF 5% 63V
2758	5322 122 32268	470pF 5% 63V
2759	5322 122 32268	470pF 5% 63V
2760	5322 122 32268	470pF 5% 63V
2761	4822 122 32927	220nF 20% 50V
2762	4822 122 32927	220nF 20% 50V
2763	5322 122 32268	470pF 5% 63V
2764	5322 122 32268	470pF 5% 63V
2765	4822 124 12095	100µF 20% 16V
2766	4822 124 12095	100µF 20% 16V
2767	5322 122 32286	3.3pF 5% 50V
2768	5322 122 32286	3.3pF 5% 50V
2769	4822 126 13482	470nF 80/20% 16V
2770	5322 126 11583	10nF 10% 50V 0603
2771	4822 122 33177	10nF 20% 50V
2772	4822 126 13956	68pF 5% 63V 0603
2773	5322 122 31647	1nF 10% 63V
2774	5322 122 31647	1nF 10% 63V
2775	4822 126 13482	470nF 80/20% 16V
2776	4822 126 13956	68pF 5% 63V 0603
2777	4822 124 23002	10µF 20% 16V
2778	4822 124 23002	10µF 20% 16V
2779	4822 126 14585	100nF 10% 50V
2780	4822 124 23002	10µF 20% 16V
2781	4822 126 14585	100nF 10% 50V
2782	4822 124 23002	10µF 20% 16V
2787	5322 126 10223	4.7nF 10% 63V
2788	5322 126 10223	4.7nF 10% 63V
2801	4822 122 33761	22pF 5% 50V
2802	4822 124 12398	4.7µF 20% 25V
2803	4822 124 12398	4.7µF 20% 25V
2804	4822 122 32927	220nF 20% 50V
2805	4822 122 32927	220nF 20% 50V
2808	4822 124 12095	100µF 20% 16V
2809	5322 126 10511	1nF 5% 50V
2810	5322 126 10511	1nF 5% 50V
2811	5322 126 10511	1nF 5% 50V
2846	4822 124 23002	10µF 20% 16V
2847	4822 124 23002	10µF 20% 16V
2848	4822 124 23002	10µF 20% 16V
2849	4822 124 23002	10µF 20% 16V
2852	4822 122 32927	220nF 20% 50V
2853	4822 122 32927	220nF 20% 50V
2854	4822 122 32927	220nF 20% 50V
2855	4822 122 32927	220nF 20% 50V
2856	4822 122 32927	220nF 20% 50V
2857	4822 122 32927	220nF 20% 50V
2858	4822 122 32927	220nF 20% 50V
2859	4822 122 32927	220nF 20% 50V
2860	4822 122 32927	220nF 20% 50V
2861	4822 122 32927	220nF 20% 50V
2864	4822 124 81151	22µF 50V
2867	4822 122 32927	220nF 20% 50V
2868	4822 122 32927	220nF 20% 50V
2869	4822 124 40196	220µF 20% 16V
2870	4822 122 32927	220nF 20% 50V
2871	4822 122 32927	220nF 20% 50V
2872	4822 124 40207	100µF 20% 25V
2873	5322 126 10511	1nF 5% 50V
2890	4822 122 33177	10nF 20% 50V
2891	4822 126 14585	100nF 10% 50V
2897	2238 586 59812	100nF 20-80% 50V 0603

-WW-

3001	2322 704 66201	620Ω 1% 0603
3003	3198 031 14710	4 x 470Ω 5% 1206
3004	3198 031 14710	4 x 470Ω 5% 1206
3005	3198 031 14710	4 x 470Ω 5% 1206
3006	4822 051 30103	10k 5% 0.062W
3007	5322 117 13053	6k8 1% 0.063W 0603
3009	3198 031 14710	4 x 470Ω 5% 1206
3010	5322 117 13042	3K9 1% 0.063W 0603
3011	4822 051 30472	4k7 5% 0.062W
3023	3198 031 14710	4 x 470Ω 5% 1206
3024	4822 051 30471	470Ω 5% 0.062W
3027	3198 031 14710	4 x 470Ω 5% 1206
3028	3198 031 14710	4 x 470Ω 5% 1206
3029	4822 051 30471	470Ω 5% 0.062W
3030	3198 031 11010	4 x 100Ω 5% 1206
3031	4822 117 13577	330Ω 1% 0805 1.25W
3032	4822 051 30471	470Ω 5% 0.062W
3033	4822 117 13523	220Ω 5% RESN 0.63W
3034	4822 051 30103	10k 5% 0.062W
3035	4822 051 30103	10k 5% 0.062W
3036	4822 117 13524	2.2k 5% 0.63W
3039	4822 051 30333	33k 5% 0.062W
3041	4822 117 10833	10k 1% 0.1W
3042	4822 051 20474	470k 5% 0.1W
3043	4822 051 30472	4k7 5% 0.062W
3045	4822 051 20273	27k 5% 0.1W
3047	4822 117 13525	24k 1% 0.62W 0603
3048	4822 117 13526	150Ω 5% 0.63W
3059	4822 051 30681	680Ω 5% 0.062W
3062	4822 117 12925	47k 1% 0.063W 0603
3063	4822 051 30472	4k7 5% 0.062W
3066	4822 117 10833	10k 1% 0.1W
3067	4822 051 30472	4k7 5% 0.062W
3068	4822 051 30103	10k 5% 0.062W
3069	4822 051 30689	68Ω 5% 0.063W 0603
3070	4822 051 30103	10k 5% 0.062W
3071	4822 051 30472	4k7 5% 0.062W
3072	4822 117 10834	47k 1% 0.1W
3073	4822 051 20472	4k7 5% 0.1W
3074	4822 117 10837	100k 1% 0.1W
3075	4822 051 30472	4k7 5% 0.062W
3076	4822 051 30472	4k7 5% 0.062W
3080	3198 031 11010	4 x 100Ω 5% 1206
3090	3198 031 11010	4 x 100Ω 5% 1206
3091	3198 031 11010	4 x 100Ω 5% 1206
3092	3198 031 11010	4 x 100Ω 5% 1206
3093	3198 031 11010	4 x 100Ω 5% 1206
3094	3198 031 11010	4 x 100Ω 5% 1206
3095	3198 031 11010	4 x 100Ω 5% 1206
3096	3198 031 11010	4 x 100Ω 5% 1206
3097	3198 031 11010	4 x 100Ω 5% 1206
3098	3198 031 11010	4 x 100Ω 5% 1206
3099	3198 031 11010	4 x 100Ω 5% 1206
3102	4822 117 11449	2k2 5% 0.1W 0805
3103	4822 051 20008	Jumper 0805
3104	4822 051 20008	Jumper 0805
3106	4822 051 20479	47Ω 5% 0.1W
3110	4822 117 11449	2k2 5% 0.1W 0805
3111	4822 117 11449	2k2 5% 0.1W 0805
3112	4822 051 20472	4k7 5% 0.1W
3114	4822 051 20472	4k7 5% 0.1W
3118	4822 051 20391	390Ω 5% 0.1W
3119	4822 051 20479	47Ω 5% 0.1W
3124	4822 051 30101	100Ω 5% 0.062W
3133	4822 117 12955	2k7 1% 0.1W 0805
3135	4822 051 20472	4k7 5% 0.1W
3136	4822 117 11503	220Ω 1% 0.1W
3137	4822 051 10102	1k 2% 0.25W
3138	4822 117 11448	180Ω 1% 0.1W
3139	4822 117 11139	1k5 1% 0.1W
3140	4822 117 12955	2k7 1% 0.1W 0805
3141	4822 051 30562	5k6 5% 0.063W 0603
3142	4822 051 30102	1k 5% 0.062W
3143	4822 051 30102	1k 5% 0.062W
3145	4822 051 30391	390Ω 5% 0.062W
3146	4822 051 20223	22k 5% 0.1W
3147	4822 052 10109	10Ω 5% 0.33W
3152	4822 051 20471	470Ω 5% 0.1W
3153	4822 051 10102	1k 2% 0.25W
3154	4822 117 11503	220Ω 1% 0.1W
3155	4822 117 11503	220Ω 1% 0.1W
3200	4822 117 10353	150Ω 1% 0.1W
3201	4822 117 10353	150Ω 1% 0.1W
3202	4822 117 10353	150Ω 1% 0.1W
3203	4822 117 10353	150Ω 1% 0.1W
3204	4822 052 10688	6Ω8 5% 0.33W
3205	4822 051 20471	470Ω 5% 0.1W
3206	4822 117 11927	75Ω 1% 0.1W
3207	4822 051 20561	560Ω 5% 0.1W
3208	4822 051 20399	39Ω 5% 0.1W
3209	4822 117 11927	75Ω 1% 0.1W
3210	4822 117 11927	75Ω 1% 0.1W
3211	4822 117 11927	75Ω 1% 0.1W
3212	2322 734 63609	36Ω 1% 0805
3213	4822 117 11927	75Ω 1% 0.1W
3214	4822 051 30102	1k 5% 0.062W
3215	4822 117 11927	75Ω 1% 0.1W
3216	4822 051 20822	8k2 5% 0,1W
3217	4822 051 30102	1k 5% 0.062W
3218	4822 051 20392	3k9 5% 0.1W
3219	4822 051 10102	1k 2% 0.25W
3220	4822 051 10102	1k 2% 0.25W
3221	4822 117 10353	150Ω 1% 0.1W
3222	4822 117 10353	150Ω 1% 0.1W
3223	4822 117 10353	150Ω 1% 0.1W
3224	4822 117 10353	150Ω 1% 0.1W
3225	4822 052 10688	6Ω8 5% 0.33W
3226	4822 051 30102	1k 5% 0.062W
3227	4822 051 20399	39Ω 5% 0.1W
3228	4822 051 30101	100Ω 5% 0.062W
3229	4822 051 30103	10k 5% 0.062W
3230	4822 051 20561	560Ω 5% 0.1W
3231	2322 734 63609	36Ω 1% 0805
3232	4822 117 12521	68Ω 1% 0.1W
3233	4822 117 10353	150Ω 1% 0.1W
3234	4822 051 20399	39Ω 5% 0.1W
3235	4822 117 10353	150Ω 1% 0.1W
3236	4822 117 11927	75Ω 1% 0.1W
3239	4822 051 30102	1k 5% 0.062W
3240	4822 117 11927	75Ω 1% 0.1W
3241	4822 117 10353	150Ω 1% 0.1W
3242	4822 051 20822	8k2 5% 0,1W
3243	4822 117 10353	150Ω 1% 0.1W
3244	4822 051 10102	1k 2% 0.25W
3245	4822 051 20392	3k9 5% 0.1W
3246	4822 051 10102	1k 2% 0.25W
3248	4822 117 13577	330Ω 1% 0805 1.25W
3249	4822 117 12955	2k7 1% 0.1W 0805
3250	4822 117 11139	1k5 1% 0.1W
3251	4822 051 30102	1k 5% 0.062W
3252	2322 734 63309	33Ω 1% 0.1W 0805
3253	4822 051 20391	390Ω 5% 0.1W
3254	4822 051 10102	1k 2% 0.25W
3255	4822 051 10102	1k 2% 0.25W
3256	4822 117 11927	75Ω 1% 0.1W
3257	4822 117 10353	150Ω 1% 0.1W
3258	4822 117 10353	150Ω 1% 0.1W
3259	4822 051 30273	27k 5% 0.062W
3262	4822 117 12925	47k 1% 0.063W 0603
3263	4822 051 30221	220Ω 5% 0.062W
3264	4822 051 20822	8k2 5% 0,1W
3265	4822 117 12955	2k7 1% 0.1W 0805
3266	4822 117 10833	10k 1% 0.1W
3267	4822 051 30102	1k 5% 0.062W
3268	4822 051 30102	1k 5% 0.062W
3269	4822 051 30561	560Ω 5% 0.062W
3270	4822 051 10102	1k 2% 0.25W
3271	4822 051 10102	1k 2% 0.25W
3272	4822 117 10353	150Ω 1% 0.1W
3273	4822 051 20822	8k2 5% 0,1W
3274	4822 117 12955	2k7 1% 0.1W 0805
3275	4822 051 30339	33Ω 5% 0.062W
3276	4822 051 30391	390Ω 5% 0.062W
3277	4822 051 30222	2k2 5% 0.062W
3278	4822 051 30331	330Ω 5% 0.062W
3279	4822 051 30151	150Ω 5% 0.062W
3281	4822 117 12903	1k8 1% 0.063W 0603
3282	4822 117 13632	100k 1% 0603 0.62W
3283	4822 051 30683	68k 5% 0.062W
3284	4822 117 13632	100k 1% 0603 0.62W
3285	4822 051 30683	68k 5% 0.062W
3286	4822 117 13632	100k 1% 0603 0.62W
3287	4822 051 30683	68k 5% 0.062W
3288	4822 051 30101	100Ω 5% 0.062W
3289	4822 051 30101	100Ω 5% 0.062W
3290	4822 052 10478	4Ω7 5% 0.33W
3291	4822 051 30561	560Ω 5% 0.062W
3292	4822 051 30103	10k 5% 0.062W
3293	4822 051 30471	470Ω 5% 0.062W
3294	4822 051 30103	10k 5% 0.062W
3295	4822 051 30471	470Ω 5% 0.062W
3296	4822 051 30103	10k 5% 0.062W
3297	4822 051 30103	10k 5% 0.062W
3298	4822 117 13632	100k 1% 0603 0.62W
3299	4822 051 30683	68k 5% 0.062W
3300	4822 052 10688	6Ω8 5% 0.33W
3302	4822 051 30101	100Ω 5% 0.062W
3303	4822 051 30101	100Ω 5% 0.062W
3304	4822 051 30101	100Ω 5% 0.062W
3307	4822 051 30102	1k 5% 0.062W
3308	4822 051 30102	1k 5% 0.062W
3309	4822 051 30333	33k 5% 0.062W
3310	4822 051 20332	3k3 5% 0.1W
3311	4822 051 30102	1k 5% 0.062W

3312	4822 117 13632	100k 1% 0603 0.62W
3317	4822 051 30102	1k 5% 0.062W
3318	4822 051 30102	1k 5% 0.062W
3321	4822 051 30102	1k 5% 0.062W
3322	4822 051 30102	1k 5% 0.062W
3323	4822 051 20393	39k 5% 0.1W
3324	4822 051 20274	270kΩ 5% 0.1W
3325	4822 051 30102	1k 5% 0.062W
3326	4822 051 30221	220Ω 5% 0.062W
3330	4822 051 30684	680k 5% 0.062W
3331	4822 117 12925	47k 1% 0.063W 0603
3332	4822 051 30183	18k 5% 0.062W
3340	4822 051 30123	12k 5% 0.062W
3341	4822 051 10102	1k 2% 0.25W
3342	4822 051 30103	10k 5% 0.062W
3343	4822 117 10837	100k 1% 0.1W
3344	4822 051 30103	10k 5% 0.062W
3350	4822 051 30474	470k 5% 0.062W
3351	4822 117 12891	220k 1% 0.063W 0603
3352	4822 051 30332	3k3 5% 0.062W
3353	4822 117 12903	1k8 1% 0.063W 0603
3369	4822 051 30103	10k 5% 0.062W
3370	4822 051 30103	10k 5% 0.062W
3400	4822 051 20391	390Ω 5% 0.1W
3401	4822 051 20391	390Ω 5% 0.1W
3402	4822 051 20391	390Ω 5% 0.1W
3404	4822 051 20008	Jumper 0805
3405	4822 051 20008	Jumper 0805
3406	4822 051 20008	Jumper 0805
3407	4822 117 10361	680Ω 1% 0.1W
3408	4822 117 10361	680Ω 1% 0.1W
3409	4822 117 10361	680Ω 1% 0.1W
3420	4822 117 12925	47k 1% 0.063W 0603
3422	4822 117 11449	2k2 5% 0.1W 0805
3423	4822 051 20008	Jumper 0805
3426	4822 051 30333	33k 5% 0.062W
3427	4822 051 30154	150k 5% 0.062W
3428	4822 051 30222	2k2 5% 0.062W
3429	4822 051 30271	270Ω 5% 0.062W
3439	4822 117 10833	10k 1% 0.1W
3440	4822 051 20393	39k 5% 0.1W
3441	4822 117 10833	10k 1% 0.1W
3454	4822 051 20008	Jumper 0805
3460	4822 051 30008	Jumper 0603
3461	4822 051 30223	22k 5% 0.062W
3521	4822 117 13632	100k 1% 0603 0.62W
3530	4822 051 30101	100Ω 5% 0.062W
3531	4822 051 30101	100Ω 5% 0.062W
3532	4822 116 83933	15k 1% 0.1W
3538	4822 052 10228	2Ω2 5% 0.33W
3545	4822 051 30471	470Ω 5% 0.062W
3546	4822 051 30471	470Ω 5% 0.062W
3551	4822 051 30271	270Ω 5% 0.062W
3554	4822 051 10102	1k 2% 0.25W
3556	4822 117 10833	10k 1% 0.1W
3557	4822 051 30479	47Ω 5% 0.062W
3558	4822 051 20225	2M2 5% 0805
3565	4822 051 30101	100Ω 5% 0.062W
3566	4822 051 30101	100Ω 5% 0.062W
3567	4822 117 11373	100Ω 1% 0805
3568	4822 051 20471	470Ω 5% 0.1W
3569	4822 051 30479	47Ω 5% 0.062W
3570	3198 031 11010	4 x 100Ω 5% 1206
3583	4822 051 30101	100Ω 5% 0.062W
3584	4822 051 30471	470Ω 5% 0.062W
3585	4822 051 30479	47Ω 5% 0.062W
3590	4822 117 11454	820Ω 1% 0,1W
3750	4822 052 10228	2Ω2 5% 0.33W
3753	4822 051 30008	Jumper 0603
3754	4822 051 30008	Jumper 0603
3755	4822 051 30101	100Ω 5% 0.062W
3756	4822 051 30101	100Ω 5% 0.062W
3758	4822 051 30683	68k 5% 0.062W
3760	4822 051 30683	68k 5% 0.062W
3761	4822 051 30682	6k8 5% 0.062W
3762	4822 051 20472	4k7 5% 0.1W
3769	4822 117 11507	6k8 1% 0.1W
3770	4822 117 11507	6k8 1% 0.1W
3771	4822 116 83933	15k 1% 0.1W
3772	4822 116 83933	15k 1% 0.1W
3773	4822 051 20472	4k7 5% 0.1W
3780	4822 051 30682	6k8 5% 0.062W
3781	4822 051 30561	560Ω 5% 0.062W
3783	4822 117 11373	100Ω 1% 0805
3784	4822 051 30008	Jumper 0603
3785	4822 051 30008	Jumper 0603
3798	4822 117 10834	47k 1% 0.1W
3799	4822 117 12925	47k 1% 0.063W 0603
3800	4822 051 30682	6k8 5% 0.062W
3801	4822 051 30103	10k 5% 0.062W
3802	4822 117 12891	220k 1% 0.063W 0603
3828	4822 051 30008	Jumper 0603
3829	4822 051 30008	Jumper 0603
3832	4822 051 10102	1k 2% 0.25W
3833	4822 051 30103	10k 5% 0.062W
3840	4822 051 30103	10k 5% 0.062W
3844	4822 117 12925	47k 1% 0.063W 0603
3845	4822 117 12925	47k 1% 0.063W 0603
3850	4822 051 20332	3k3 5% 0.1W
3851	4822 051 20332	3k3 5% 0.1W
3854	4822 117 10833	10k 1% 0.1W
3855	4822 117 10833	10k 1% 0.1W
3856	4822 117 10833	10k 1% 0.1W
3857	4822 117 10833	10k 1% 0.1W
3858	4822 117 10833	10k 1% 0.1W
3859	4822 117 10833	10k 1% 0.1W
3860	4822 117 10833	10k 1% 0.1W
3861	4822 117 10833	10k 1% 0.1W
3866	4822 117 11373	100Ω 1% 0805
3867	4822 117 11373	100Ω 1% 0805
3868	4822 051 20008	Jumper 0805
3869	4822 051 20008	Jumper 0805
3872	4822 117 10833	10k 1% 0.1W
3873	4822 117 10833	10k 1% 0.1W
3877	4822 051 20332	3k3 5% 0.1W
3878	4822 051 20332	3k3 5% 0.1W
3879	4822 051 20332	3k3 5% 0.1W
3880	4822 051 20332	3k3 5% 0.1W
3881	4822 051 20332	3k3 5% 0.1W
3882	4822 051 20332	3k3 5% 0.1W
3890	4822 051 30008	Jumper 0603
3892	4822 051 20008	Jumper 0805
3895	4822 051 30103	10k 5% 0.062W
3899	4822 051 20008	Jumper 0805
4005	4822 051 20008	Jumper 0805
4008	4822 051 30008	Jumper 0603
4010	4822 051 30008	Jumper 0603
4012	4822 051 30008	Jumper 0603
4015	4822 051 20008	Jumper 0805
4017	4822 051 30008	Jumper 0603
4021	4822 051 30008	Jumper 0603
4023	4822 051 30008	Jumper 0603
4024	4822 051 30008	Jumper 0603
4027	4822 051 30008	Jumper 0603
4029	4822 051 30008	Jumper 0603
4105	4822 051 20008	Jumper 0805
4109	4822 051 20008	Jumper 0805
4110	4822 051 20008	Jumper 0805
4111	4822 051 20008	Jumper 0805
4226	4822 051 20008	Jumper 0805
4227	4822 051 20008	Jumper 0805
4316	4822 051 20008	Jumper 0805
4402	4822 051 20008	Jumper 0805
4403	4822 051 20008	Jumper 0805
4406	4822 051 20008	Jumper 0805
4407	4822 051 20008	Jumper 0805
4413	4822 051 20008	Jumper 0805
4414	4822 051 20008	Jumper 0805
4420	4822 051 20008	Jumper 0805
4421	4822 117 12662	4 x 10Ω 5%
4423	4822 051 20008	Jumper 0805
4424	4822 051 20008	Jumper 0805
4426	4822 051 30008	Jumper 0603
4429	4822 051 20008	Jumper 0805
4433	4822 051 20008	Jumper 0805
4434	4822 051 20008	Jumper 0805
4435	4822 051 20008	Jumper 0805
4436	4822 051 30008	Jumper 0603
4500	4822 051 20008	Jumper 0805
4700	4822 051 20008	Jumper 0805
4701	4822 051 20008	Jumper 0805
4725	4822 051 20008	Jumper 0805
4726	4822 051 30008	Jumper 0603
4734	4822 051 20008	Jumper 0805
4735	4822 051 20008	Jumper 0805
4745	4822 051 20008	Jumper 0805
4805	4822 051 20008	Jumper 0805
4806	4822 051 20008	Jumper 0805
4810	4822 051 30008	Jumper 0603
4812	4822 051 20008	Jumper 0805
4813	4822 051 20008	Jumper 0805

〰

5002	4822 157 11775	6.8µH 5% 5X3
5101	4822 157 11775	6.8µH 5% 5X3
5102	3198 018 33370	0.33µH 10% 0805
5103	4822 157 11776	Coil var. 40.4MHz
5106	4822 157 10977	4.7µH 10%
5108	2422 549 44811	Coil var.78MHz
5301	4822 157 11876	6.8µH 10% 0805
5302	4822 157 11876	6.8µH 10% 0805
5305	4822 157 11119	2.7µH 10%
5306	4822 157 11119	2.7µH 10%
5307	4822 157 11119	2.7µH 10%
5501	4822 157 11775	6.8µH 5% 5X3
5502	4822 157 11775	6.8µH 5% 5X3
5540	4822 157 71304	1µH 10% 0805
5559	4822 157 11775	6.8µH 5% 5X3
5560	4822 157 11775	6.8µH 5% 5X3
5562	4822 157 11775	6.8µH 5% 5X3
5564▲	4822 252 51175	Fuse 2.5A 65V MP250
5565▲	4822 252 51175	Fuse 2.5A 65V MP250
5751	4822 157 11775	6.8µH 5% 5X3
5752	4822 157 11775	6.8µH 5% 5X3
5753	4822 157 11775	6.8µH 5% 5X3
5757	4822 157 11876	6.8µH 10% 0805
5759	4822 157 70503	4.7µH 5%

▷|

6001	4822 130 11422	PLVA2650A
6002	4822 130 11422	PLVA2650A
6003	4822 130 11422	PLVA2650A
6004	4822 130 11422	PLVA2650A
6006	4822 130 11422	PLVA2650A
6008	4822 130 11422	PLVA2650A
6009	4822 130 11422	PLVA2650A
6012	4822 130 11422	PLVA2650A
6013	4822 130 11422	PLVA2650A
6017	4822 130 11422	PLVA2650A
6019	4822 130 11422	PLVA2650A
6021	4822 130 11422	PLVA2650A
6023	4822 130 11422	PLVA2650A
6025	4822 130 11423	PLVA2656A
6026	4822 130 11423	PLVA2656A
6037	9322 129 34685	BZM55-C3V9
6039	4822 130 83757	BAS216
6040	9322 129 37685	BZM55-C5V6
6101	9322 149 10685	BZM55-C33
6103	4822 130 11525	1SS356
6104	4822 130 11525	1SS356
6106	4822 130 83757	BAS216
6107	4822 130 83757	BAS216
6200	9322 129 40685	BZM55-C10
6201	4822 130 10852	BZX284-C6V8
6202	9322 129 40685	BZM55-C10
6203	9322 129 40685	BZM55-C10
6204	4822 130 10852	BZX284-C6V8
6205	9322 129 40685	BZM55-C10
6206	9322 129 40685	BZM55-C10
6207	4822 130 10852	BZX284-C6V8
6208	9322 129 40685	BZM55-C10
6209	9322 129 40685	BZM55-C10
6210	4822 130 10852	BZX284-C6V8
6211	4822 130 10852	BZX284-C6V8
6212	4822 130 10852	BZX284-C6V8
6213	4822 130 10852	BZX284-C6V8
6214	9322 129 40685	BZM55-C10
6215	9322 129 40685	BZM55-C10
6216	9322 129 40685	BZM55-C10
6217	9322 129 40685	BZM55-C10
6218	9340 548 61115	PDZ12B
6219	4822 130 10852	BZX284-C6V8
6220	9322 129 40685	BZM55-C10
6221	9322 129 40685	BZM55-C10
6222	4822 130 10852	BZX284-C6V8
6223	9322 129 40685	BZM55-C10
6224	9322 129 40685	BZM55-C10
6225	4822 130 10852	BZX284-C6V8
6226	4822 130 10852	BZX284-C6V8
6227	4822 130 10852	BZX284-C6V8
6228	4822 130 10852	BZX284-C6V8
6229	9322 129 40685	BZM55-C10
6230	9322 129 40685	BZM55-C10
6231	9322 129 40685	BZM55-C10
6232	9322 129 40685	BZM55-C10
6233	4822 130 10852	BZX284-C6V8
6234	9322 129 40685	BZM55-C10
6235	9322 129 40685	BZM55-C10
6236	9322 129 40685	BZM55-C10
6237	9322 129 40685	BZM55-C10
6238	4822 130 11528	1PS76SB10
6240	9322 129 40685	BZM55-C10
6241	9322 129 40685	BZM55-C10
6242	9322 129 40685	BZM55-C10
6243	9322 129 40685	BZM55-C10
6244	4822 130 10852	BZX284-C6V8
6250	4822 130 11528	1PS76SB10
6340	4822 130 83757	BAS216
6341	4822 130 11594	BZX284-C47
6344	4822 130 83757	BAS216
6350	4822 130 82346	BZV55-C27
6420	9322 129 37685	BZM55-C5V6
6422	4822 130 83757	BAS216
6424	4822 130 83757	BAS216
6429	9322 129 37685	BZM55-C5V6
6430	4822 130 83757	BAS216
6431	4822 130 83757	BAS216
6750	9322 150 82685	BAT60J

751	9322 129 40685	BZM55-C10
752	9322 129 40685	BZM55-C10
753	9322 129 40685	BZM55-C10
754	9322 129 40685	BZM55-C10
757	9322 150 82685	BAT60J
759	4822 130 83757	BAS216

001	9322 157 20668	MSM51V18165F-60J
002	3104 317 44701	Software (check Prod.Surv.)
003	9352 684 81557	SAA5801H/015
006	4822 130 60373	BC856B
007	5322 130 60159	BC846B
008	4822 209 16977	M24C32-WBN6
009	4822 209 16978	LF33CV
010	4822 209 73852	PMBT2369
011	4822 130 11155	PDTC114ET
012	3198 010 44010	PDTA114ET
013	9322 149 03668	M29W400BT-90M1
014	5322 130 60159	BC846B
015	4822 130 60373	BC856B
016	5322 130 60159	BC846B
019	4822 130 10255	MUN2213
103	5322 130 60159	BC846B
104	5322 130 60159	BC846B
107	4822 130 60373	BC856B
111	5322 130 60159	BC846B
112	5322 130 60159	BC846B
113	4822 209 72042	L78L05ACZ
200	4822 130 40959	BC547B
201	4822 130 40959	BC547B
203	4822 130 44568	BC557B
204	5322 130 60159	BC846B
205	5322 130 60159	BC846B
206	5322 130 60159	BC846B
207	4822 130 60373	BC856B
208	9322 105 08668	TEA6415CD
209	4822 209 12776	TDA8601T/C1
216	5322 130 60159	BC846B
300	9352 681 65518	TDA9330N3
341	4822 130 60373	BC856B
351	4822 130 60373	BC856B
418	4822 130 60373	BC856B
419	4822 130 60373	BC856B
420	4822 130 60373	BC856B
424	4822 130 60373	BC856B
501	9352 625 24518	TDA9321H/N2
502	5322 130 60159	BC846B
555	4822 130 60373	BC856B
560	3122 357 20664	COMB 2D FTV
561	5322 130 60159	BC846B
575	5322 130 60159	BC846B
751	9322 148 35668	MSP3410D-PS-C5
752	5322 209 11102	HEF4052BT
753	5322 209 11102	HEF4052BT
756	4822 209 30095	LM833D
773	5322 130 60159	BC846B
774	5322 130 60159	BC846B
777	9322 116 87668	TEA6422D
801	5322 130 60159	BC846B

eature Box [L]

arious

025	3104 301 23824	FBX-shield top
026	3104 301 23834	FBX-shield botom
361	4822 267 10974	Connector 9P m v 2.50 Wh
362	4822 267 10974	Connector 9P m v 2.50 Wh
701	4822 242 10685	Crystal 12MHz

⊣⊢

701	4822 126 13887	4.7pF 50V
704	4822 126 11663	12pF 5% 50V 0603
707	4822 126 11663	12pF 5% 50V 0603
709	2238 586 59812	100nF 20-80% 50V 0603
710	4822 124 80791	470µF 20% 16V
712	4822 126 13881	470pF 5% 50V
713	4822 122 33761	22pF 5% 50V
714	4822 122 33761	22pF 5% 50V
718	4822 122 33752	15pF 5% 50V
719	4822 122 33752	15pF 5% 50V
720	4822 122 33752	15pF 5% 50V
721	2020 552 94427	100pF 5% 50v 0603
722	2020 552 94427	100pF 5% 50v 0603
723	4822 126 14225	56pF 5% 50V 0603
724	4822 126 14225	56pF 5% 50V 0603
725	4822 124 40248	10µF 20% 63V
726	2238 586 59812	100nF 20-80% 50V 0603
2727	4822 124 40255	100µF 20% 63V
2728	4822 124 40248	10µF 20% 63V
2729	2238 586 59812	100nF 20-80% 50V 0603
2730	4822 124 40255	100µF 20% 63V
2740	2238 916 15641	22nF 10% 25V 0603
2741	2238 916 15641	22nF 10% 25V 0603
2742	2238 916 15641	22nF 10% 25V 0603
2745	2238 586 59812	100nF 20-80% 50V 0603
2746	2238 586 59812	100nF 20-80% 50V 0603
2747	4822 124 40769	4.7µF 20% 100V
2748	2238 586 59812	100nF 20-80% 50V 0603
2749	4822 124 40255	100µF 20% 63V
2750	2238 586 59812	100nF 20-80% 50V 0603
2751	2238 586 59812	100nF 20-80% 50V 0603
2752	2238 586 59812	100nF 20-80% 50V 0603
2753	2238 586 59812	100nF 20-80% 50V 0603
2754	4822 124 40769	4.7µF 20% 100V
2755	2238 586 59812	100nF 20-80% 50V 0603
2756	2238 586 59812	100nF 20-80% 50V 0603
2757	2238 916 15641	22nF 10% 25V 0603
2758	4822 126 14507	18pF 5% 50V 0603
2759	4822 126 14507	18pF 5% 50V 0603
2760	2238 586 59812	100nF 20-80% 50V 0603
2761	2238 586 59812	100nF 20-80% 50V 0603
2762	2238 586 59812	100nF 20-80% 50V 0603
2763	2238 586 59812	100nF 20-80% 50V 0603
2764	2238 586 59812	100nF 20-80% 50V 0603
2765	2238 586 59812	100nF 20-80% 50V 0603
2766	2238 586 59812	100nF 20-80% 50V 0603
2767	2238 586 59812	100nF 20-80% 50V 0603
2769	2238 586 59812	100nF 20-80% 50V 0603
2773	2238 586 59812	100nF 20-80% 50V 0603
2775	2238 586 59812	100nF 20-80% 50V 0603
2777	2238 586 59812	100nF 20-80% 50V 0603
2779	2238 586 59812	100nF 20-80% 50V 0603
2781	2238 586 59812	100nF 20-80% 50V 0603
2782	2238 586 59812	100nF 20-80% 50V 0603
2783	2238 586 59812	100nF 20-80% 50V 0603
2784	2238 586 59812	100nF 20-80% 50V 0603
2785	2238 586 59812	100nF 20-80% 50V 0603
2786	2238 586 59812	100nF 20-80% 50V 0603
2787	2238 586 59812	100nF 20-80% 50V 0603
2788	2238 586 59812	100nF 20-80% 50V 0603
2789	2238 586 59812	100nF 20-80% 50V 0603
2790	2238 586 59812	100nF 20-80% 50V 0603
2791	2238 586 59812	100nF 20-80% 50V 0603
2792	4822 124 40248	10µF 20% 63V
2793	2238 586 59812	100nF 20-80% 50V 0603
2794	4822 124 40248	10µF 20% 63V
2795	2238 586 59812	100nF 20-80% 50V 0603
2796	2238 586 59812	100nF 20-80% 50V 0603
2797	2238 586 59812	100nF 20-80% 50V 0603
2798	2238 586 59812	100nF 20-80% 50V 0603
2799	2238 586 59812	100nF 20-80% 50V 0603
2800	2238 586 59812	100nF 20-80% 50V 0603
2801	2238 586 59812	100nF 20-80% 50V 0603
2802	2238 586 59812	100nF 20-80% 50V 0603
2803	2238 586 59812	100nF 20-80% 50V 0603
2804	2238 586 59812	100nF 20-80% 50V 0603
2805	2238 586 59812	100nF 20-80% 50V 0603
2806	4822 124 40255	100µF 20% 63V
2807	2238 586 59812	100nF 20-80% 50V 0603
2808	4822 124 40248	10µF 20% 63V
2809	2238 586 59812	100nF 20-80% 50V 0603
2813	2238 586 59812	100nF 20-80% 50V 0603
2817	2238 586 59812	100nF 20-80% 50V 0603
2822	2238 586 59812	100nF 20-80% 50V 0603
2825	2238 586 59812	100nF 20-80% 50V 0603
2826	2238 586 59812	100nF 20-80% 50V 0603
2829	2238 586 59812	100nF 20-80% 50V 0603
2832	2238 586 59812	100nF 20-80% 50V 0603
2833	2238 586 59812	100nF 20-80% 50V 0603
2835	2238 586 59812	100nF 20-80% 50V 0603
2838	2238 586 59812	100nF 20-80% 50V 0603
2845	2238 586 59812	100nF 20-80% 50V 0603
2847	2238 586 59812	100nF 20-80% 50V 0603
2848	2238 586 59812	100nF 20-80% 50V 0603
2849	2238 586 59812	100nF 20-80% 50V 0603
2850	2238 586 59812	100nF 20-80% 50V 0603
2851	2238 586 59812	100nF 20-80% 50V 0603
2852	2238 586 59812	100nF 20-80% 50V 0603
2853	2238 586 59812	100nF 20-80% 50V 0603
2854	2238 586 59812	100nF 20-80% 50V 0603
2855	2238 586 59812	100nF 20-80% 50V 0603
2856	2238 586 59812	100nF 20-80% 50V 0603
2858	2238 586 59812	100nF 20-80% 50V 0603
2859	2238 586 59812	100nF 20-80% 50V 0603
2860	2238 586 59812	100nF 20-80% 50V 0603
2861	2238 586 59812	100nF 20-80% 50V 0603
2862	2238 586 59812	100nF 20-80% 50V 0603
2863	2238 586 59812	100nF 20-80% 50V 0603
2864	2238 586 59812	100nF 20-80% 50V 0603
2865	2238 586 59812	100nF 20-80% 50V 0603
2866	2238 586 59812	100nF 20-80% 50V 0603
2867	2238 586 59812	100nF 20-80% 50V 0603
2868	4822 124 40248	10µF 20% 63V
2869	2238 586 59812	100nF 20-80% 50V 0603
2870	4822 124 40255	100µF 20% 63V
2871	2238 586 59812	100nF 20-80% 50V 0603
2872	2238 586 59812	100nF 20-80% 50V 0603
2885	2238 586 59812	100nF 20-80% 50V 0603
2888	2238 586 59812	100nF 20-80% 50V 0603
2889	2238 586 59812	100nF 20-80% 50V 0603
2890	2238 586 59812	100nF 20-80% 50V 0603
2891	2238 586 59812	100nF 20-80% 50V 0603
2892	2238 586 59812	100nF 20-80% 50V 0603
2893	2238 586 59812	100nF 20-80% 50V 0603
2894	2238 586 59812	100nF 20-80% 50V 0603
2895	2238 586 59812	100nF 20-80% 50V 0603
2896	2238 586 59812	100nF 20-80% 50V 0603
2897	4822 124 40248	10µF 20% 63V
2898	2238 586 59812	100nF 20-80% 50V 0603
2899	2238 586 59812	100nF 20-80% 50V 0603
2901	2238 586 59812	100nF 20-80% 50V 0603
2902	2238 586 59812	100nF 20-80% 50V 0603
2903	2238 586 59812	100nF 20-80% 50V 0603
2904	2238 586 59812	100nF 20-80% 50V 0603
2905	2238 586 59812	100nF 20-80% 50V 0603
2906	2238 586 59812	100nF 20-80% 50V 0603
2907	2238 586 59812	100nF 20-80% 50V 0603
2908	2238 586 59812	100nF 20-80% 50V 0603
2909	4822 124 40255	100µF 20% 63V
2910	4822 126 11669	27pF 5% 50V 0603
2911	4822 126 14223	2.2pF +-0.25pF 50V 0603
2912	4822 126 11663	12pF 5% 50V 0603
2913	4822 126 11663	12pF 5% 50V 0603
2914	4822 126 11669	27pF 5% 50V 0603
2915	4822 126 11663	12pF 5% 50V 0603
2916	4822 126 11663	12pF 5% 50V 0603
2917	4822 126 14223	2.2pF +-0.25pF 50V 0603
2918	4822 126 14223	2.2pF +-0.25pF 50V 0603
2920	4822 126 11669	27pF 5% 50V 0603
2921	4822 126 11663	12pF 5% 50V 0603
2922	4822 126 11663	12pF 5% 50V 0603
2923	2238 586 59812	100nF 20-80% 50V 0603
2924	2238 586 59812	100nF 20-80% 50V 0603
2925	2238 586 59812	100nF 20-80% 50V 0603
2926	2238 586 59812	100nF 20-80% 50V 0603
2927	2238 586 59812	100nF 20-80% 50V 0603
2928	2238 586 59812	100nF 20-80% 50V 0603
2929	4822 126 13956	68pF 5% 63V 0603

-WW-

3700	4822 051 30008	Jumper 0603
3701	4822 051 30008	Jumper 0603
3702	4822 051 30008	Jumper 0603
3703	4822 051 30221	220Ω 5% 0.062W
3704	4822 051 30221	220Ω 5% 0.062W
3705	4822 051 30221	220Ω 5% 0.062W
3709	4822 051 30101	100Ω 5% 0.062W
3710	4822 051 30101	100Ω 5% 0.062W
3713	4822 051 30181	180Ω 5% 0.062W
3714	4822 051 30181	180Ω 5% 0.062W
3715	4822 051 30181	180Ω 5% 0.062W
3716	4822 117 13632	100k 1% 0603 0.62W
3717	4822 117 13632	100k 1% 0603 0.62W
3718	4822 117 13632	100k 1% 0603 0.62W
3719	4822 051 30008	Jumper 0603
3720	4822 051 30008	Jumper 0603
3721	4822 051 30008	Jumper 0603
3725	4822 051 30332	3k3 5% 0.062W
3726	4822 117 11817	1k2 1% 1/16W
3727	4822 051 30151	150Ω 5% 0.062W
3728	4822 051 30151	150Ω 5% 0.062W
3729	4822 051 30689	68Ω 5% 0.063W 0603
3730	4822 051 30689	68Ω 5% 0.063W 0603
3731	4822 051 30472	4k7 5% 0.062W
3732	4822 051 30472	4k7 5% 0.062W
3733	4822 051 30472	4k7 5% 0.062W
3735	4822 051 30472	4k7 5% 0.062W
3740	4822 051 30008	Jumper 0603
3741	4822 051 30008	Jumper 0603
3742	4822 051 30008	Jumper 0603
3752	4822 051 20108	1Ω 5% 0.1W
3753	4822 117 12917	1Ω 5% 0.062W 0603
3758	4822 051 30472	4k7 5% 0.062W
3759	4822 051 30221	220Ω 5% 0.062W
3760	4822 051 30105	1M 5% 0.062W
3762	4822 051 30339	33Ω 5% 0.062W
3763	4822 117 12139	22Ω 5% 0.062W
3764	4822 051 30109	10Ω 5% 0.062W
3773	4822 117 12925	47k 1% 0.063W 0603
3774	4822 117 12925	47k 1% 0.063W 0603
3781	4822 117 12925	47k 1% 0.063W 0603
3782	4822 117 12925	47k 1% 0.063W 0603
3783	4822 117 12925	47k 1% 0.063W 0603

3784	4822 051 30102	1k 5% 0.062W
3787	4822 051 30154	150k 5% 0.062W
3788	4822 117 12891	220k 1% 0.063W 0603
3789	4822 051 30472	4k7 5% 0.062W
3790	4822 051 30101	100Ω 5% 0.062W
3791	4822 051 30101	100Ω 5% 0.062W
3792	4822 051 30102	1k 5% 0.062W
3793	4822 051 30392	3k9 5% 0.063W 0603
3794	4822 117 12903	1k8 1% 0.063W 0603
3795	4822 051 30183	18k 5% 0.062W
3796	4822 051 30123	12k 5% 0.062W
3797	4822 051 30153	15k 5% 0.062W
3798	4822 051 30183	18k 5% 0.062W
3803	5322 117 13058	150Ω 1% 0.063W 0603
3804	5322 117 13058	150Ω 1% 0.063W 0603
3805	4822 051 30102	1k 5% 0.062W
3806	4822 051 30102	1k 5% 0.062W
3811	5322 117 13058	150Ω 1% 0.063W 0603
3812	5322 117 13058	150Ω 1% 0.063W 0603
3813	5322 117 13058	150Ω 1% 0.063W 0603
3820	5322 117 13058	150Ω 1% 0.063W 0603
3826	4822 051 30759	75Ω 5% 0.062W
3827	4822 051 30759	75Ω 5% 0.062W
3828	5322 117 13049	470Ω 1% 0.063W 0603
3829	4822 051 30391	390Ω 5% 0.062W
3830	5322 117 13045	270Ω 1% 0.063W 0603
3831	5322 117 13051	680R 1% 0.063W 0603
3832	4822 117 13577	330Ω 1% 0805 1.25W
3833	4822 051 30759	75Ω 5% 0.062W
3834	4822 051 30759	75Ω 5% 0.062W
3835	4822 051 30759	75Ω 5% 0.062W
3836	4822 051 30759	75Ω 5% 0.062W
3837	5322 117 13049	470Ω 1% 0.063W 0603
3838	4822 051 30391	390Ω 5% 0.062W
3839	5322 117 13049	470Ω 1% 0.063W 0603
3840	5322 117 13018	1k0 1% 0.063W 0603
3841	4822 117 13577	330Ω 1% 0805 1.25W
3842	4822 051 30759	75Ω 5% 0.062W
3843	4822 051 30759	75Ω 5% 0.062W
3844	4822 051 30759	75Ω 5% 0.062W
3845	4822 051 30759	75Ω 5% 0.062W
3846	5322 117 13049	470Ω 1% 0.063W 0603
3847	4822 051 30391	390Ω 5% 0.062W
3848	5322 117 13062	390R 1% 0.063W 0603
3849	5322 117 13047	330Ω 1% 0.063W 0603
3850	4822 117 13577	330Ω 1% 0805 1.25W
3851	4822 051 30759	75Ω 5% 0.062W
3852	4822 051 30759	75Ω 5% 0.062W
3853	4822 117 12902	8k2 1% 0.063W 0603
3854	4822 051 30392	3k9 5% 0.063W 0603
3855	4822 051 30102	1k 5% 0.062W
3856	4822 051 30102	1k 5% 0.062W
3857	4822 052 10109	10Ω 5% 0.33W
3858	4822 051 30222	2k2 5% 0.062W
3859	4822 051 30222	2k2 5% 0.062W
3860	4822 051 30102	1k 5% 0.062W
3861	4822 051 30332	3k3 5% 0.062W
3862	4822 051 30103	10k 5% 0.062W
3863	4822 051 30681	680Ω 5% 0.062W
3864	4822 117 12925	47k 1% 0.063W 0603
3865	4822 051 30472	4k7 5% 0.062W
3870	4822 051 30109	10Ω 5% 0.062W
3871	4822 117 12971	15Ω 5% 0.62W 0603
3872	4822 117 12925	47k 1% 0.063W 0603
3999	4822 051 30472	4k7 5% 0.062W
4704	4822 051 30008	Jumper 0603
4712	4822 051 30008	Jumper 0603
4713	2238 586 59812	100nF 20-80% 50V 0603
4714	4822 051 30008	Jumper 0603
4715	2238 586 59812	100nF 20-80% 50V 0603
4716	4822 051 30008	Jumper 0603
4717	4822 051 30008	Jumper 0603
4721	4822 051 30008	Jumper 0603
4722	2238 586 59812	100nF 20-80% 50V 0603
4723	4822 051 30008	Jumper 0603
4724	2238 586 59812	100nF 20-80% 50V 0603
4725	4822 051 30008	Jumper 0603
4727	4822 051 30008	Jumper 0603
4728	4822 051 30008	Jumper 0603
4729	4822 051 30008	Jumper 0603
4731	4822 051 30008	Jumper 0603
4733	4822 051 30008	Jumper 0603
4735	4822 051 30008	Jumper 0603
4740	4822 051 30008	Jumper 0603
4741	4822 117 12662	4 x 10Ω 5%
4752	4822 051 30008	Jumper 0603
4754	4822 051 30008	Jumper 0603
4765	4822 051 30008	Jumper 0603
4766	4822 051 30008	Jumper 0603

5700	4822 157 71304	1µH 10% 0805
5701	4822 157 71304	1µH 10% 0805
5702	4822 157 71304	1µH 10% 0805
5703	4822 157 11716	Bead 30Ω at 100MHz
5704	4822 157 11716	Bead 30Ω at 100MHz
5705	4822 157 11716	Bead 30Ω at 100MHz
5706	4822 157 11716	Bead 30Ω at 100MHz
5707	4822 051 20008	Jumper 0805
5708	4822 051 20008	Jumper 0805
5709	4822 051 20008	Jumper 0805
5710	4822 157 11716	Bead 30Ω at 100MHz
5711	4822 157 11716	Bead 30Ω at 100MHz
5712	4822 157 11716	Bead 30Ω at 100MHz
5713	4822 157 11716	Bead 30Ω at 100MHz
5714	4822 157 71206	Bead 600Ω at 100MHz
5715	4822 156 21729	Bead 1kΩ at 100MHz
5716	4822 156 21729	Bead 1kΩ at 100MHz
5717	4822 156 21729	Bead 1kΩ at 100MHz
5718	4822 157 11716	Bead 30Ω at 100MHz
5719	4822 156 21729	Bead 1kΩ at 100MHz
5723	4822 157 11716	Bead 30Ω at 100MHz
5724	4822 157 11716	Bead 30Ω at 100MHz
5725	4822 157 11716	Bead 30Ω at 100MHz
5726	4822 156 21729	Bead 1kΩ at 100MHz
5727	4822 156 21729	Bead 1kΩ at 100MHz
5728	4822 157 11716	Bead 30Ω at 100MHz
5729	4822 156 21729	Bead 1kΩ at 100MHz
5730	4822 157 11716	Bead 30Ω at 100MHz
5731	4822 156 21729	Bead 1kΩ at 100MHz
5732	4822 157 10586	2.2µH 10% 0805
5733	4822 157 10586	2.2µH 10% 0805
5734	4822 157 10586	2.2µH 10% 0805
5736	4822 156 21729	Bead 1kΩ at 100MHz

7703	4822 209 73852	PMBT2369
7704	4822 209 73852	PMBT2369
7705	4822 209 17398	LD1117DT33
7706	9322 160 50668	LD1117DT25
7711	2422 486 80938	Socket 32p f
7712	5322 209 60424	74HC573D
7713	9352 688 09557	SAA4978H/V204 Y
7714	9965 000 02179	MS81V04160-25TB
7717	9322 183 81668	MSM54V12222B-25JS
7718	9352 695 58557	SAA4993H/V1
7719	9322 183 81668	MSM54V12222B-25JS
7720	4822 209 17398	LD1117DT33
7722	9965 000 02179	MS81V04160-25TB
7723	9965 000 02179	MS81V04160-25TB
7724	9322 188 08702	T8F24EF-0002 EAGLE
7725	9322 160 50668	LD1117DT25
7727	5322 130 60159	BC846B
7728	5322 130 60159	BC846B
7729	5322 130 60159	BC846B
7730	5322 130 42718	BFS20
7731	5322 130 42718	BFS20
7732	5322 130 42718	BFS20
7733	5322 130 42718	BFS20
7734	5322 130 42718	BFS20
7735	5322 130 42718	BFS20
7736	5322 130 60159	BC846B
7739	9322 170 14668	LF15ABDT
7740	4822 209 73852	PMBT2369
7741	4822 209 73852	PMBT2369
7999	3104 317 44661	Software (check Prod.Surv.)

FDS PIP [M]

Various

0344	4822 267 10963	Connector 3P m v 2.50 Wh
0348	4822 267 11043	Connector 3P m v 2.50 Ye
0351	4822 267 10962	Connector 11P m v 2.50 Wh
0352	4822 267 10962	Connector 11P m v 2.50 Wh
0353	4822 267 10974	Connector 9P m v 2.50 Wh
1102	3139 147 16621	UV1316/A P-3
1102	3139 147 18841	Tuner UV1316/A P X-3
1105	4822 242 10688	Filter OFWK9456M
1107	4822 242 72211	Filter 5.5 MHz
1109	4822 242 81436	Filter OFWK3953M
1198	3104 301 08351	Cable phono-phono 120mm
1525	4822 242 10695	Crystal 4.433 619 MHz
1528	4822 242 10697	Crystal 3.579 545 MHz
1601	4822 242 10314	Filter 5.5 MHz
1602	4822 242 81265	Filter 6.0
1603	4822 242 81299	Filter 6.5
1800	2422 086 10581	Fuse 400mA 65V
8044	3104 311 01311	Cable 3P/340/3P Wh
8048	3104 311 04091	Cable 3P/220/3P YE

2101	4822 124 80195	470µF 20% 10V
2102	4822 126 13473	220nF 80-20% 50V
2104	4822 122 33177	10nF 20% 50V
2105	4822 122 33177	10nF 20% 50V
2106	4822 122 33575	220pF 5% 63V
2107	4822 126 13956	68pF 5% 63V 0603
2108	5322 126 10225	1P5 5%
2109	4822 124 22652	2.2µF 20% 50V
2110	4822 124 21913	1µF 20% 63V
2111	4822 126 14585	100nF 10% 50V
2112	4822 122 33891	3.3nF 10% 63V
2116	4822 124 12095	100µF 20% 16V
2117	4822 126 14076	220nF 25V. 20%
2118	3198 016 35680	5.6pF +/-0.5pF 50V 0603
2118	4822 126 13956	68pF 5% 63V 0603
2118	4822 126 14487	8.2pF 0.5% 50V 0603
2119	5322 122 31863	330pF 5% 63V
2120	4822 126 14076	220nF 25V. 20%
2140	4822 126 14491	2.2µF -20+80% 10V 0805
2501	4822 126 14305	100nF 10% 16V 0603
2504	4822 126 14305	100nF 10% 16V 0603
2520	4822 126 14305	100nF 10% 16V 0603
2521	4822 126 14305	100nF 10% 16V 0603
2522	5322 126 11579	3.3nF 10% 63V
2525	4822 126 14507	18pF 5% 50V 0603
2528	4822 122 33752	15pF 5% 50V
2532	4822 126 14043	1µF 20% 16V
2534	5322 126 10223	4.7nF 10% 63V
2536	4822 126 14491	2.2µF -20+80% 10V 0805
2537	4822 126 14585	100nF 10% 50V
2538	4822 124 80151	47µF 20% 16V
2539	4822 126 14585	100nF 10% 50V
2540	4822 124 80151	47µF 20% 16V
2541	4822 126 14585	100nF 10% 50V
2545	4822 126 14305	100nF 10% 16V 0603
2600	4822 126 14491	2.2µF -20+80% 10V 0805
2601	4822 126 14585	100nF 10% 50V
2603	4822 126 14491	2.2µF -20+80% 10V 0805
2605	4822 126 14585	100nF 10% 50V
2620	4822 122 32927	220nF 20% 50V
2621	4822 126 14585	100nF 10% 50V
2622	4822 122 32927	220nF 20% 50V
2623	4822 122 32927	220nF 20% 50V
2624	5322 124 41945	22µF 20% 35V SMD
2625	4822 122 32927	220nF 20% 50V
2626	4822 126 14585	100nF 10% 50V
2627	5322 122 32654	22nF 10% 63V
2628	4822 126 14585	100nF 10% 50V
2629	4822 122 32927	220nF 20% 50V
2630	4822 124 80408	4.7µF 20% 50V
2632	4822 122 32927	220nF 20% 50V
2633	4822 126 14585	100nF 10% 50V
2638	4822 126 14491	2.2µF -20+80% 10V 0805
2639	4822 124 23002	10µF 20% 16V
2640	4822 124 23002	10µF 20% 16V
2650	4822 124 80195	470µF 20% 10V
2748	4822 126 14305	100nF 10% 16V 0603
2749	4822 126 14305	100nF 10% 16V 0603
2752	4822 126 14305	100nF 10% 16V 0603
2753	4822 126 14305	100nF 10% 16V 0603
2754	4822 126 14305	100nF 10% 16V 0603
2755	4822 126 14305	100nF 10% 16V 0603
2756	4822 126 14305	100nF 10% 16V 0603
2757	4822 126 14305	100nF 10% 16V 0603
2758	3198 017 41050	1µF 10V 0603
2759	4822 126 14305	100nF 10% 16V 0603
2761	4822 126 14305	100nF 10% 16V 0603
2762	4822 126 14305	100nF 10% 16V 0603
2763	4822 126 14305	100nF 10% 16V 0603
2766	4822 126 14305	100nF 10% 16V 0603
2767	4822 126 14305	100nF 10% 16V 0603
2768	4822 126 14305	100nF 10% 16V 0603
2769	4822 126 14305	100nF 10% 16V 0603
2770	4822 126 14305	100nF 10% 16V 0603
2771	4822 126 14305	100nF 10% 16V 0603
2772	4822 126 14305	100nF 10% 16V 0603
2773	4822 126 14305	100nF 10% 16V 0603
2774	4822 126 14305	100nF 10% 16V 0603
2775	4822 126 14305	100nF 10% 16V 0603
2776	4822 126 14305	100nF 10% 16V 0603
2777	4822 126 14305	100nF 10% 16V 0603
2778	4822 126 14305	100nF 10% 16V 0603
2779	4822 126 14305	100nF 10% 16V 0603
2780	4822 126 14305	100nF 10% 16V 0603
2781	4822 126 14305	100nF 10% 16V 0603
2782	4822 126 14305	100nF 10% 16V 0603
2783	4822 124 23002	10µF 20% 16V
2784	4822 124 23002	10µF 20% 16V
2785	4822 122 33177	10nF 20% 50V
2786	4822 122 33177	10nF 20% 50V

2787	4822 126 14305	100nF 10% 16V 0603
2788	5322 122 32531	100pF 5% 50V
2789	4822 126 13692	47pF 1% 63V
2791	5322 122 32658	22pF 5% 50V
2794	5322 122 32658	22pF 5% 50V
2795	4822 124 12095	100µF 20% 16V
2796	4822 124 12095	100µF 20% 16V
2797	4822 124 12095	100µF 20% 16V
2798	4822 122 33777	47pF 5% 63V
2800	4822 126 13879	220nF 20% 16V
2801	4822 126 13879	220nF 20% 16V
2802	4822 126 13879	220nF 20% 16V
2803	4822 126 13879	220nF 20% 16V
2804	4822 126 13879	220nF 20% 16V
2805	4822 126 13879	220nF 20% 16V
2807	4822 126 14585	100nF 10% 50V
2840	4822 126 14585	100nF 10% 50V
2845	4822 122 33777	47pF 5% 63V
2860	4822 126 14305	100nF 10% 16V 0603
2880	5322 124 41945	22µF 20% 35V SMD
2881	4822 124 40433	47µF 20% 25V
2882	4822 124 11912	220µF 20% 6.3V
2883	4822 124 12095	100µF 20% 16V
2884	4822 126 14491	2.2µF -20+80% 10V 0805
2890	4822 126 14585	100nF 10% 50V
2891	4822 126 14585	100nF 10% 50V
2922	4822 126 14241	330pF 50V 0603
2923	4822 126 14305	100nF 10% 16V 0603
2932	4822 122 33753	150pF 5% 50V
2934	4822 126 14305	100nF 10% 16V 0603
2942	4822 122 33753	150pF 5% 50V
2944	4822 126 14305	100nF 10% 16V 0603
2972	4822 126 14241	330pF 50V 0603
2973	4822 126 14305	100nF 10% 16V 0603
2982	4822 122 33753	150pF 5% 50V
2983	4822 126 14305	100nF 10% 16V 0603
2992	4822 122 33753	150pF 5% 50V
2993	4822 126 14305	100nF 10% 16V 0603

-ww-

3100	4822 051 20273	27k 5% 0.1W
3101	4822 051 20273	27k 5% 0.1W
3102	4822 051 30562	5k6 5% 0.063W 0603
3103	4822 051 20008	Jumper 0805
3103	4822 117 11373	100Ω 1% 0805
3104	4822 051 20008	Jumper 0805
3104	4822 117 11373	100Ω 1% 0805
3106	4822 117 11927	75Ω 1% 0.1W
3110	4822 117 11449	2k2 5% 0.1W 0805
3111	4822 117 11449	2k2 5% 0.1W 0805
3112	4822 051 20472	4k7 5% 0.1W
3114	4822 051 20472	4k7 5% 0.1W
3118	4822 051 20391	390Ω 5% 0.1W
3119	4822 117 12521	68Ω 1% 0.1W
3124	4822 051 30101	100Ω 5% 0.062W
3133	4822 117 12955	2k7 1% 0.1W 0805
3135	4822 051 20472	4k7 5% 0.1W
3136	4822 117 11503	220Ω 1% 0.1W
3137	4822 051 10102	1k 2% 0.25W
3138	4822 117 11448	180Ω 1% 0.1W
3139	4822 117 11139	1k5 1% 0.1W
3140	4822 051 30393	39k 5% 0.062W
3142	4822 051 10102	1k 2% 0.25W
3143	4822 051 10102	1k 2% 0.25W
3145	4822 051 20121	120Ω 5% 0,1W
3146	4822 051 20223	22k 5% 0.1W
3151	4822 052 10128	1Ω2 5% 0.33W
3501	4822 051 30101	100Ω 5% 0.062W
3504	4822 051 30101	100Ω 5% 0.062W
3521	4822 117 13632	100k 1% 0603 0.62W
3530	4822 051 30101	100Ω 5% 0.062W
3531	4822 051 30101	100Ω 5% 0.062W
3532	4822 116 83933	15k 1% 0.1W
3538	4822 052 10478	4Ω7 5% 0.33W
3545	4822 051 30471	470Ω 5% 0.062W
3546	4822 051 30471	470Ω 5% 0.062W
3550	4822 051 20471	470Ω 5% 0.1W
3601	4822 117 10361	680Ω 1% 0.1W
3602	4822 051 20471	470Ω 5% 0.1W
3603	4822 051 20471	470Ω 5% 0.1W
3604	4822 051 20273	27k 5% 0.1W
3605	4822 051 20391	390Ω 5% 0.1W
3620	4822 117 11507	6k8 1% 0.1W
3621	4822 117 11507	6k8 1% 0.1W
3622	4822 117 11373	100Ω 1% 0805
3623	4822 117 10361	680Ω 1% 0.1W
3624	4822 117 11454	820Ω 1% 0,1W
3625	4822 117 11454	820Ω 1% 0,1W
3642	4822 051 20562	5k6 5% 0.1W 0805
3650	4822 052 10688	6Ω8 5% 0.33W
3747	4822 051 20223	22k 5% 0.1W
3748	4822 051 20223	22k 5% 0.1W
3750	4822 051 30393	39k 5% 0.062W
3751	4822 051 30393	39k 5% 0.062W
3752	4822 051 30103	10k 5% 0.062W
3753	4822 051 30332	3k3 5% 0.062W
3754	4822 117 11817	1k2 1% 1/16W
3755	4822 051 30391	390Ω 5% 0.062W
3756	4822 051 30101	100Ω 5% 0.062W
3757	4822 051 30101	100Ω 5% 0.062W
3765	4822 051 20683	68k 5% 0.1W
3766	4822 117 11139	1k5 1% 0.1W
3767	4822 051 20683	68k 5% 0.1W
3768	4822 117 11139	1k5 1% 0.1W
3780	4822 051 30222	2k2 5% 0.062W
3781	4822 117 13632	100k 1% 0603 0.62W
3782	4822 051 30222	2k2 5% 0.062W
3783	4822 117 13632	100k 1% 0603 0.62W
3796	4822 051 20121	120Ω 5% 0,1W
3797	4822 051 20121	120Ω 5% 0,1W
3798	4822 051 20121	120Ω 5% 0,1W
3799	4822 051 20121	120Ω 5% 0,1W
3841	4822 117 11503	220Ω 1% 0.1W
3842	4822 117 11503	220Ω 1% 0.1W
3843	4822 051 30221	220Ω 5% 0.062W
3844	4822 051 30682	6k8 5% 0.062W
3845	4822 117 13632	100k 1% 0603 0.62W
3846	4822 117 10833	10k 1% 0.1W
3847	4822 117 10833	10k 1% 0.1W
3880	4822 051 30102	1k 5% 0.062W
3923	4822 051 30471	470Ω 5% 0.062W
3924	4822 051 30101	100Ω 5% 0.062W
3928	4822 051 30101	100Ω 5% 0.062W
3932	4822 051 30101	100Ω 5% 0.062W
3935	4822 051 30102	1k 5% 0.062W
3937	4822 051 30151	150Ω 5% 0.062W
3942	4822 051 30101	100Ω 5% 0.062W
3943	4822 051 30102	1k 5% 0.062W
3947	4822 051 30151	150Ω 5% 0.062W
3950	4822 117 11504	270Ω 1% 0.1W
3951	4822 051 20339	33Ω 5% 0.1W
3952	4822 117 11504	270Ω 1% 0.1W
3953	4822 117 11448	180Ω 1% 0.1W
3954	4822 051 20391	390Ω 5% 0.1W
3955	4822 117 11503	220Ω 1% 0.1W
3956	4822 117 10361	680Ω 1% 0.1W
3957	4822 117 10361	680Ω 1% 0.1W
3958	4822 117 10361	680Ω 1% 0.1W
3960	4822 051 10102	1k 2% 0.25W
3961	4822 051 10102	1k 2% 0.25W
3962	4822 051 10102	1k 2% 0.25W
3963	4822 051 10102	1k 2% 0.25W
3964	4822 051 10102	1k 2% 0.25W
3965	4822 051 10102	1k 2% 0.25W
3966	4822 051 20479	47Ω 5% 0.1W
3967	4822 051 20479	47Ω 5% 0.1W
3968	4822 051 20479	47Ω 5% 0.1W
3972	4822 051 30471	470Ω 5% 0.062W
3974	4822 051 30101	100Ω 5% 0.062W
3978	4822 051 30101	100Ω 5% 0.062W
3981	4822 051 30101	100Ω 5% 0.062W
3983	4822 051 30102	1k 5% 0.062W
3987	4822 051 30151	150Ω 5% 0.062W
3991	4822 051 30101	100Ω 5% 0.062W
3992	4822 051 30102	1k 5% 0.062W
3997	4822 051 30151	150Ω 5% 0.062W
3999	4822 051 20333	33k 5% 0.1W
4105	4822 051 20008	Jumper 0805
4106	4822 051 20008	Jumper 0805
4109	4822 051 20008	Jumper 0805
4110	4822 051 20008	Jumper 0805
4111	4822 051 30008	Jumper 0603
4603	4822 051 20008	Jumper 0805
4604	4822 051 20008	Jumper 0805

-~~-

5101	4822 157 11775	6.8µH 5% 5X3
5102	4822 157 71303	0.39µH 10% 0805
5103	4822 157 11776	Coil var. 40.4MHz
5106	4822 157 10977	4.7µH 10%
5108	2422 549 44811	Coil var.78MHz
5108	4822 157 11534	Coil var. 78MHz
5501	4822 157 11775	6.8µH 5% 5X3
5502	4822 157 11775	6.8µH 5% 5X3
5620	4822 157 11775	6.8µH 5% 5X3
5621	4822 157 11775	6.8µH 5% 5X3
5752	4822 157 71694	0.82µH 10%
5880	2422 535 94406	2.7µH 10%
5881	4822 157 71694	0.82µH 10%
5882	4822 157 71694	0.82µH 10%
5921	4822 157 10586	2.2µH 10% 0805
5971	4822 157 10586	2.2µH 10% 0805

-▷|-

6103	4822 130 11525	1SS356
6104	4822 130 11525	1SS356
6106	4822 130 83757	BAS216
6107	4822 130 83757	BAS216
6850	4822 130 11525	1SS356
6880	9322 129 32685	BZM55-C2V7
6881	9322 129 32685	BZM55-C2V7
6883	4822 130 11422	PLVA2650A
6884	4822 130 11422	PLVA2650A

-⊗ ▭

7103	4822 130 60511	BC847B
7104	4822 130 60511	BC847B
7107	4822 130 60373	BC856B
7111	4822 130 60511	BC847B
7501	9352 625 24518	TDA9321H/N2
7502	4822 130 60511	BC847B
7600	9350 399 00118	TDA9820T/V1
7620	5322 209 16349	TDA7309D
7621	4822 130 60511	BC847B
7622	4822 130 60373	BC856B
7700	9352 637 90557	SAB9079HS/N2
7750	9322 124 83668	MSM5416283-60GS
7757	4822 209 31378	NJM4556MB
7800	4822 209 12776	TDA8601T/C1
7821	9322 135 04668	74V1G08
7840	5322 209 14481	HEF4053BT
7845	4822 130 60511	BC847B
7850	4822 209 73852	PMBT2369
7851	4822 130 10255	MUN2213
7860	4822 209 13252	PCF8574TS/F3
7880	9322 116 74668	LD1117D33
7881	9322 116 74668	LD1117D33
7900	4822 130 60383	BF824
7901	4822 130 60383	BF824
7902	4822 130 60383	BF824
7903	4822 130 60383	BF824
7904	4822 130 60383	BF824
7905	4822 130 60383	BF824
7920	4822 130 60511	BC847B
7930	4822 130 60511	BC847B
7940	4822 130 60511	BC847B
7970	4822 130 60511	BC847B
7980	4822 130 60511	BC847B
7990	4822 130 60511	BC847B
7991	4822 209 16868	M24C04-WMN6

Power Supply [PS]

Various

0005	3122 121 35811	Earth contact
0011	3122 421 60171	Spring
0300	2422 030 00304	Socket 2P m h mains
0306	4822 265 41391	Connector 9p m
0307	2422 025 12485	Connector 11p m
0320	4822 265 11253	Fuse holder 2p
1000	4822 252 60151	Sparkgap DSP-501N-A21F
1001	2422 086 10912	Fuse T2.5A 250V 5X20
1101	9965 000 07786	Fuse T4.0A 250V
1102	9965 000 07786	Fuse T4.0A 250V
1400	2422 132 07411	Relay 1P 5V 5A

-||-

2000	4822 126 14153	2.2nF 10% 1kV
2001	2222 336 29147	330nF 20% 275V
2003	4822 126 14153	2.2nF 10% 1kV
2005	4822 124 12415	220µF 20% 400V
2006	3198 019 54710	470pF 10% 1kV
2007	3198 019 51520	1.5nF 10% 1kV
2008	4822 126 12263	220pF 10% 2kV
2009	5322 122 32531	100pF 5% 50V
2011	4822 124 80144	220µF 20% 25V
2012	4822 126 14585	100nF 10% 50V
2013	4822 126 13695	82pF 1% 63V
2014	5322 126 10511	1nF 5% 50V
2015	4822 122 33735	27nF 10% 63V
2016	5322 122 32531	100pF 5% 50V
2017	5322 122 34099	470pF 10% 63V
2018	4822 124 22652	2.2µF 20% 50V
2019	4822 126 14585	100nF 10% 50V
2020	4822 122 33127	2.2nF 10% 63V
2023	4822 126 14153	2.2nF 10% 1kV
2024	4822 126 14153	2.2nF 10% 1kV
2025	4822 124 41751	47µF 20% 50V
2030	4822 126 14208	220pF 20% 250V

2049	5322 126 10223	4.7nF 10% 63V
2050	5322 122 32531	100pF 5% 50V
2051	2020 554 90148	470pF 20% 250V
2052	3198 019 54710	470pF 10% 1kV
2053	4822 126 14208	220pF 20% 250V
2054	4822 126 14208	220pF 20% 250V
2101	4822 122 31211	100pF 10% 500V
2102	4822 121 43913	470nF 10% 100V
2103	4822 121 41673	220nF 10% 100V
2107	4822 126 13682	100pF 5% 1kV
2108	4822 124 40784	3300µF 20% 16V
2109	4822 124 81144	1000µF 16V
2110	4822 124 41751	47µF 20% 50V
2111	5322 122 32531	100pF 5% 50V
2112	4822 124 40784	3300µF 20% 16V
2113	4822 124 81144	1000µF 16V
2114	4822 124 80144	220µF 20% 25V
2115	4822 124 41751	47µF 20% 50V
2116	4822 126 14585	100nF 10% 50V
2117	4822 126 14585	100nF 10% 50V
2118	4822 126 14585	100nF 10% 50V
2119	4822 124 22726	4.7µF 20% 35V
2120	4822 126 14585	100nF 10% 50V
2121	4822 126 14585	100nF 10% 50V
2123	4822 126 14585	100nF 10% 50V
2124	4822 126 14585	100nF 10% 50V
2126	4822 126 14585	100nF 10% 50V
2127	4822 122 31211	100pF 10% 500V
2128	5322 122 32531	100pF 5% 50V
2129	4822 126 14585	100nF 10% 50V
2200	4822 126 14153	2.2nF 10% 1kV
2201	4822 126 14153	2.2nF 10% 1kV
2202	2222 151 90059	22µ 20% 400V
2203	4822 126 14208	220pF 20% 250V
2204	4822 126 14585	100nF 10% 50V
2205	5322 122 31647	1nF 10% 63V
2206	5322 122 32531	100pF 5% 50V
2207	4822 126 14525	47pF 5% 1kV
2310	5322 122 32531	100pF 5% 50V
2311	2020 021 91506	1000µF 20% 16V
2312	4822 126 14585	100nF 10% 50V
2313	4822 124 40196	220µF 20% 16V
2401	4822 126 14585	100nF 10% 50V

-WW-

3000	4822 053 21475	4M7 5% 0,5W
3001	4822 053 21475	4M7 5% 0,5W
3002	2322 595 90021	VDR 1mA/495V MAX 850V
3003	4822 053 21225	2M2 5% 0,5W
3005	2120 103 90057	100Ω 20% 0.5W
3010	4822 117 13473	22k 5% 2,5W
3011	4822 050 21003	10k 1% 0.6W
3012	4822 050 21008	1Ω 1% 0,6W
3013	4822 050 21008	1Ω 1% 0,6W
3014	4822 050 21008	1Ω 1% 0,6W
3015	4822 050 22208	2.2Ω 1% 0,6W
3016	4822 116 52186	22Ω 5% 0.5W
3017	4822 051 20472	4k7 5% 0.1W
3030	4822 117 11149	82k 1% 0,1W
3031	4822 117 10833	10k 1% 0.1W
3032	4822 051 20223	22k 5% 0.1W
3033	4822 116 83933	15k 1% 0.1W
3034	4822 116 83933	15k 1% 0.1W
3035	4822 117 10361	680Ω 1% 0.1W
3036	4822 116 83933	15k 1% 0.1W
3037	4822 051 20184	180k 5% 0.1W
3038	4822 117 13577	330Ω 1% 0805 1.25W
3039	4822 051 20223	22k 5% 0.1W
3040	4822 117 11504	270Ω 1% 0.1W
3041	4822 051 20182	1k8 5% 0.1W
3042	4822 050 23309	33Ω 1% 0,6W
3043	4822 050 21501	150Ω 1% 0,6W
3044	4822 051 20392	3k9 5% 0.1W
3101	4822 050 23302	3k3 1% 0,6W
3102	4822 050 23302	3k3 1% 0,6W
3104	4822 116 52283	4k7 5% 0.5W
3105	4822 116 52283	4k7 5% 0.5W
3106	4822 117 11373	100Ω 1% 0805
3107	4822 051 10102	1k 2% 0.25W
3108	4822 051 20392	3k9 5% 0.1W
3109	4822 116 52175	100Ω 5% 0.5W
3110	4822 117 10362	7k5 1% 0,1W
3111	2322 734 66803	68k 1% 0.1W 0805
3112	4822 117 11504	270Ω 1% 0.1W
3113	4822 117 11145	4k7 1% 0,1W
3114	4822 117 11953	560Ω 1% 0,1W
3200	4822 052 11108	1Ω 5% 0.5W
3310	4822 117 11373	100Ω 1% 0805
3311	4822 051 20471	470Ω 5% 0.1W
3312	4822 117 11145	4k7 1% 0,1W
3313	4822 117 11144	3k9 1% 0,1W
3314	4822 117 11448	180Ω 1% 0.1W
3401	4822 051 20223	22k 5% 0.1W
3402	4822 051 20223	22k 5% 0.1W
3403	4822 117 10833	10k 1% 0.1W
3999	4822 050 11002	1k 1% 0.4W

-~~-

5000	4822 157 53348	Mains filter CU15D3
5002	4822 526 10704	Bead 45Ω at 50MHz
5003	3128 138 39401	Transf. CT345D7
5004	4822 526 10704	Bead 45Ω at 50MHz
5005	4822 157 11411	Bead 83Ω at 100MHz
5102	3198 018 73380	3.3µH 20%
5103	3198 018 73380	3.3µH 20%
5104	3198 018 73380	3.3µH 20%
5200	3128 138 39411	Standby transformer
5201	4822 526 10704	Bead 45Ω at 50MHz
5202	4822 526 10704	Bead 45Ω at 50MHz
5300	4822 157 11411	Bead 83Ω at 100MHz
5301	4822 157 11411	Bead 83Ω at 100MHz

-▷|-

6000	9322 132 55667	Bridge coil GBU4JL-7002
6002	4822 130 42606	BYD33J
6005	4822 130 31878	1N4003G
6006	4822 130 31878	1N4003G
6007	4822 130 42488	BYD33D
6009	4822 130 42488	BYD33D
6010	4822 130 42606	BYD33J
6011	4822 130 30621	1N4148
6012	4822 130 30621	1N4148
6014	4822 130 42606	BYD33J
6101	4822 130 42606	BYD33J
6103	4822 130 11572	STPS8H100F
6103	9322 132 53687	STPS8H100F
6104	4822 130 42606	BYD33J
6105	4822 130 42606	BYD33J
6106	4822 130 81274	MBR745
6107	4822 130 42606	BYD33J
6108	4822 130 30621	1N4148
6109	4822 130 30621	1N4148
6110	4822 130 42606	BYD33J
6201	9336 018 60133	BZT03-C300
6202	9336 018 60133	BZT03-C300
6203	4822 130 31083	BYW55
6203	4822 130 80858	1N5062
6204	4822 130 31083	BYW55
6204	4822 130 80858	1N5062
6310	9322 161 76682	SB340L-7024
6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148

7000	9322 151 01687	STP6NC60FP
7001	4822 209 15684	MC44603AP
7002	9322 149 04682	TCET1102
7011	4822 209 16406	TL431ACD
7101	4822 130 60511	BC847B
7200	9322 037 99682	TNY256P
7202	4822 209 16406	TL431ACD
7203	9322 149 04682	TCET1102
7401	4822 130 42804	BC817-25
7402	4822 130 60511	BC847B

Standard Definition Panel [SD]

Various

0022	3122 121 67161	Earth sheet
0023	3122 121 67161	Earth sheet
0304	2422 025 12494	Connector 11P m h 2.50
0305	2422 025 12494	Connector 11P m h 2.50
0360	2422 026 05252	Socket cinch 3P Rd/Bu/Gn
0361	2422 026 05253	Socket cinch 2P F Wh/Rd
0362	2422 026 05252	Socket cinch 3P Rd/Bu/Gn
0363	2422 026 05253	Socket cinch 2P F Wh/Rd

-||-

2006	5322 122 32531	100pF 5% 50V
2010	5322 122 32531	100pF 5% 50V

-WW-

3002	4822 117 11927	75Ω 1% 0.1W
3003	4822 117 11927	75Ω 1% 0.1W
3004	4822 117 11927	75Ω 1% 0.1W
3005	4822 051 10102	1k 2% 0.25W
3006	4822 051 20332	3k3 5% 0.1W
3007	4822 051 20333	33k 5% 0.1W
3008	4822 117 10833	10k 1% 0.1W
3009	4822 051 10102	1k 2% 0.25W
3010	4822 051 20332	3k3 5% 0.1W
3011	4822 051 20333	33k 5% 0.1W
3012	4822 117 10833	10k 1% 0.1W
3999	4822 051 20333	33k 5% 0.1W

-▷|-

6001	9322 149 10685	BZM55-C33
6002	9322 149 10685	BZM55-C33
6003	9322 149 10685	BZM55-C33
6004	9322 149 10685	BZM55-C33
6005	9322 149 10685	BZM55-C33
6006	9322 149 10685	BZM55-C33
6007	9322 149 10685	BZM55-C33
6008	9322 149 10685	BZM55-C33
6009	9322 149 10685	BZM55-C33
6010	9322 149 10685	BZM55-C33